

Attachments to the Fact Sheet for VA0091383
Broad Run WRF

Attachment 1	Flow Frequency Determination
Attachment 2	Facility Process Flow Diagram
Attachment 3	Stormwater Inspection and No-Exposure Letter
Attachment 4	Topographic Map
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Attachment 7	Inspection of New Proposed Outfall Locations October 6, 2015
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ATTACHMENT 1

March 4, 2016
MEMORANDUM

TO: VPDES Reissuance File VA0091383

FROM: Alison Thompson

SUBJECT: Flow Frequency Determination of VPDES Permit No. VA0091383
Broad Run Water Reclamation Facility (WRF)

COPIES:

The reissuance of a VPDES permit for the Broad Run WRF requires a Flow Frequency determination in order to establish appropriate wasteload allocations for permit limit determination. There is a gaging station on Broad Run near Leesburg, Virginia, downstream from the proposed outfall location. The gaging station (#01644280) has a drainage area of 76.1 sq. mi.; the station still does not have enough data to generate the statistical flow information. The discharge location is less than a mile upstream from the gaging station. When the permit was originally issued, there is such a small distance between the two, staff used the drainage area for the gaging station to do a flow determination for the outfall location.

Since the outfall is now in place, the drainage area was determined to be 60 sq.mi. Since the Broad Run gaging station does not have established flow frequencies, the flows for the outfall location shall be determined using values at the Catoctin Creek gaging station at Taylors town, Virginia, and adjusting them by proportional drainage areas.

Catoctin Creek near Taylors town, VA (#01638480)

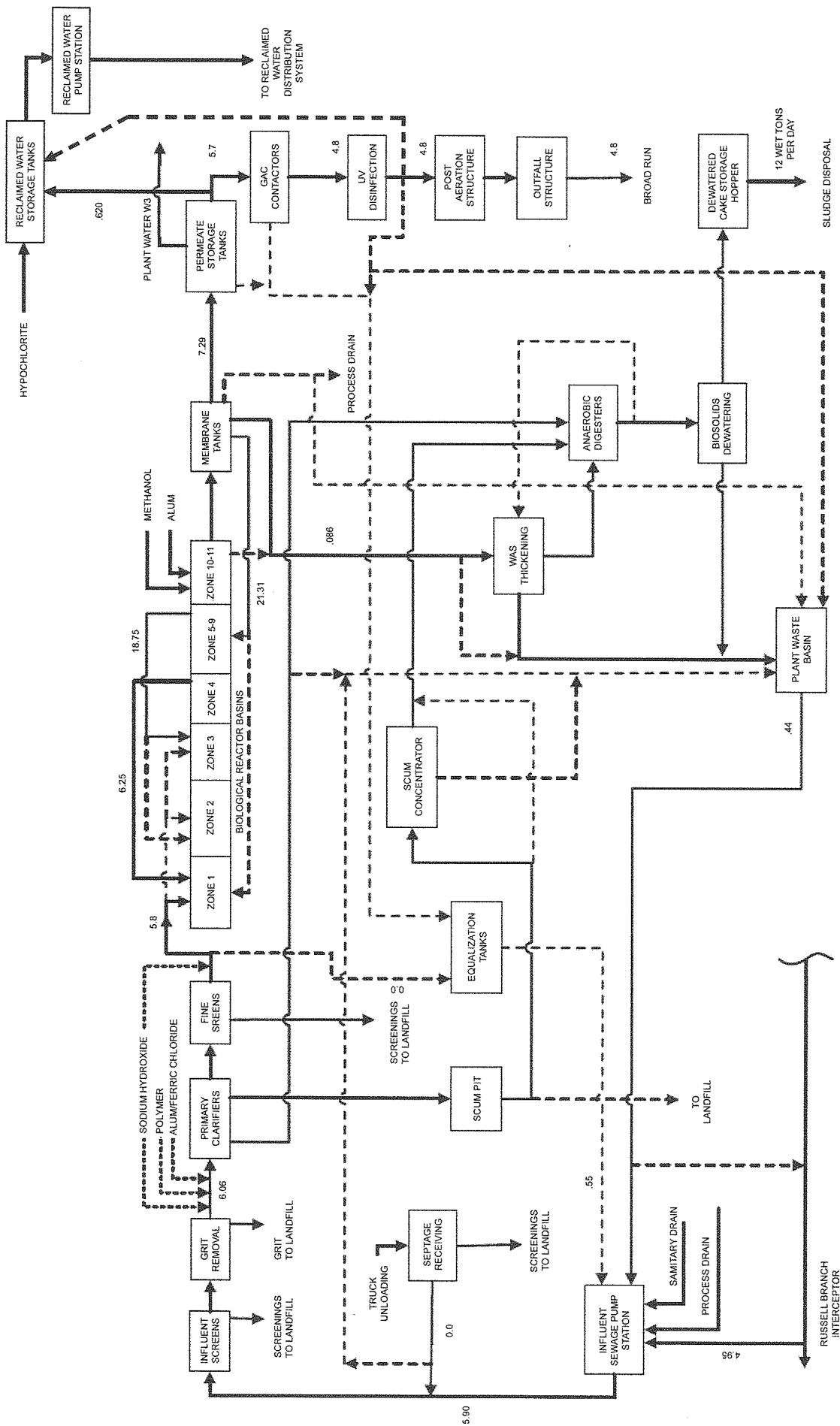
Drainage area	=	89.6 sq. mi.
1Q10	=	0.52 cfs
7Q10	=	0.63 cfs
30Q5	=	2.8 cfs
30Q10	=	1.5 cfs
High flow 30Q10	=	12 cfs
High flow 1Q10	=	4.9 cfs
High flow 7Q10	=	7.0 cfs
HM	=	11.0 cfs

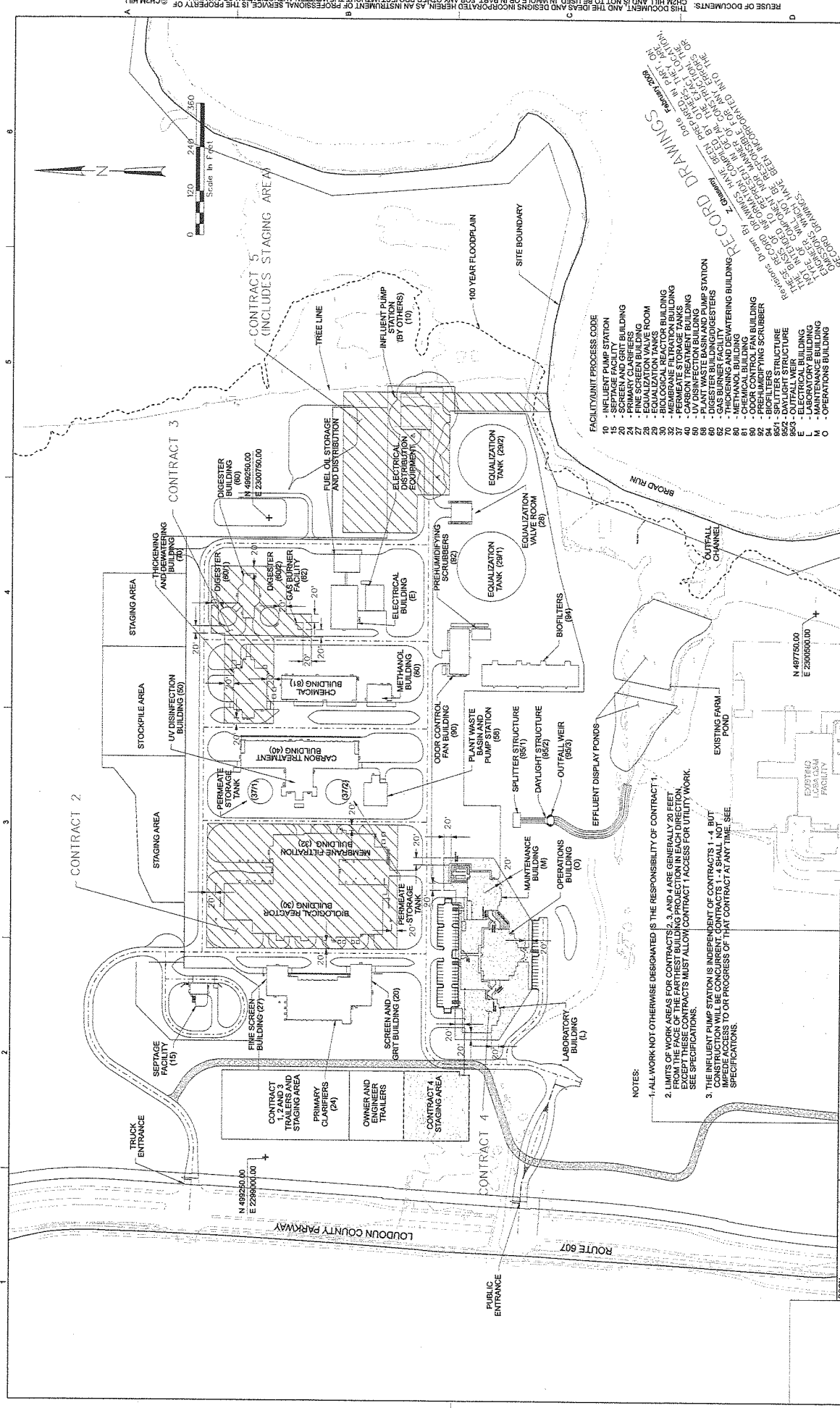
Broad Run at the discharge point for Outfall 001

Drainage area	=	60 sq. mi.	
1Q10	=	0.35 cfs	0.23 MGD
7Q10	=	0.42 cfs	0.27 MGD
30Q5	=	1.88 cfs	1.21 MGD
30Q10	=	1.00 cfs	0.65 MGD
High flow 30Q10	=	8.04 cfs	5.19 MGD
High flow 1Q10	=	3.28 cfs	2.12 MGD
High flow 7Q10	=	4.69 cfs	3.03 MGD
HM	=	7.37 cfs	4.76 MGD

The high flow months are December - May

ATTACHMENT 2





- FACILITY/UNIT PROCESS CODE
- 10 - INFLUENT PUMP STATION
 - 11 - SCREEN AND GRIT BUILDING
 - 20 - PRIMARY CLARIFIERS
 - 21 - FINE SCREEN BUILDING
 - 22 - EQUALIZATION TANKS
 - 23 - BIOLOGICAL REACTOR BUILDING
 - 24 - PERMEATE STORAGE TANKS
 - 25 - CARBON TREATMENT BUILDING
 - 26 - GAS BURNER BUILDING
 - 27 - PLANT WASTE BASIN AND PUMP STATION
 - 28 - DIGESTER BUILDING/DIGESTERS
 - 29 - METHANOL BUILDING
 - 30 - CHEMICAL BUILDING
 - 31 - FUEL OIL STORAGE AND DISTRIBUTION
 - 32 - ELECTRICAL BUILDING
 - 33 - BIOFILTERS
 - 34 - ODOR CONTROL FAN BUILDING
 - 35 - PLANT WASTE BASIN AND PUMP STATION
 - 36 - SPLITTER STRUCTURE
 - 37 - DAYLIGHT STRUCTURE
 - 38 - OUTFALL WEIR
 - 39 - EFFLUENT DISPLAY PONDS
 - 40 - EXISTING FARM POND
 - 41 - EXISTING FACILITY

NOTES:

1. ALL WORK NOT OTHERWISE DESIGNATED IS THE RESPONSIBILITY OF CONTRACT 1.
2. LIMITS OF WORK AREAS FOR CONTRACTS 2, 3, AND 4 ARE GENERALLY 20 FEET FROM THE FACE OF THE FARTEST BUILDING PROJECTION IN EACH DIRECTION. EXCEPT THESE CONTRACTS MUST ALLOW CONTRACT 1 ACCESS FOR UTILITY WORK. SEE SPECIFICATIONS.
3. THE INFLUENT PUMP STATION IS INDEPENDENT OF CONTRACTS 1-4, BUT CONTRACT 1 MUST PROVIDE ACCESS TO THE PUMP STATION AT ALL TIMES. SEE SPECIFICATIONS.

USGN		NO.		DATE		REVISION		BY		APPROVED		DATE		FILE NAME		PLOT DATE		PLOT TIME	
J. HERGEIST														46014002		17/164.dwg		05-DEC-2007	
DR		J. HERGEIST																	
CHK		N. JOHNSON																	
APPRO		D. LYNCH																	
CH2MHILL												LOUDOUN COUNTY SANITATION AUTHORITY BROAD RUN WATER RECLAMATION FACILITY				GENERAL			
VERIFY SCALE												OVERALL FACILITY AND CONTRACT BREAKOUT PLAN							
RATIO IS ONE INCH ON ORIGINAL DRAWING																			
IF NOT ONE INCH ON THIS SHEET ADJUST SCALES ACCORDINGLY.																			
SHEET 2																			
DWG G-002																			
DATE DECEMBER 2007																			
PROJECT 170164.CD																			

Broad Run Water Reclamation Facility

Process Narrative

The Broad Run Water Reclamation Facility (WRF) is owned and operated by Loudoun Water. Influent flow to the facility consists of raw sewage collected from the Russell Branch sewershed within Loudoun Water's service area. A diversion structure and interceptor convey flows to the Influent Pump Station, which is located on the Broad Run WRF site. A Septage Receiving Facility also contributes a limited amount of septage hauled in from unsewered properties in the surrounding area.

Liquids Treatment

The liquids treatment portion of the process consists of preliminary and primary treatment, biological treatment with biological nutrient removal (BNR) in a membrane bioreactor (MBR), granular activated carbon (GAC) treatment, disinfection, and post aeration. Effluent is discharged to Broad Run, which flows into the Potomac River.

The Preliminary and Primary Treatment Facility consists of influent screening (6 mm), grit removal using vortex grit separators, primary clarifiers, and fine screening (2 mm). The Preliminary and Primary Treatment Facility is designed for a hydraulic peaking factor of 2.5. Downstream facilities are designed for a hydraulic peaking factor of 1.88. Flow in excess of the 1.88 peaking factor is diverted to two 5-million gallon (MG) equalization tanks. When influent flow is reduced, the equalization tanks are drained back to the Influent Pump Station for treatment.

Facilities are provided for the addition of sodium hydroxide and various coagulant aids to the grit removal effluent. Sodium hydroxide may be provided for alkalinity addition. To assist with suspended solids and phosphorus removal, polymer, alum or ferric chloride can be added at the same location.

The biological treatment process utilizes a five-stage MBR, consisting of an anaerobic zone, an anoxic zone, an aerobic zone, a second anoxic zone, and a final aerobic/membrane zone. Immersed membranes provide filtration (i.e., liquids/solids separation). The Biological Reactor Basins (BRBs) may be operated in multiple treatment modes by reconfiguring the various recycle flow streams.

Sodium hydroxide can be added to the MBR influent for alkalinity control. Alum can be added directly to the mixed liquor for phosphorus removal. Methanol can be added to the BRBs as a supplemental carbon source to achieve low levels of effluent total nitrogen (TN).

ATTACHMENT 3



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

NORTHERN REGIONAL OFFICE

Preston Bryant
Secretary of Natural Resources

13901 Crown Court, Woodbridge, Virginia 22193
(703) 583-3800 Fax (703) 583-3821
www.deq.virginia.gov

David K. Paylor
Director

Thomas A. Faha
Regional Director

November 23, 2009

Mr. Robert Canham, P.E.
Manager
Broad Run Water Reclamation Facility
P.O. Box 4000
44865 Loudoun Water Way
Ashburn, VA 20146

Re: No Exposure Certification

Dear Mr. Canham:

Based on a site review conducted November 17, 2009, the Northern Regional Office has approved your no exposure certification. As such, a VPDES General Permit for Storm Water Discharges Associated with Industrial Activity is not required at this time. Please note that coverage may be necessary at a later date should changes to regulations be implemented or site activities change. A copy of the site visit memorandum is enclosed for your information and files.

Should you have any questions, please do not hesitate to contact me at (703) 583-3853 or susan.mackert@deq.virginia.gov.

Respectfully,

A handwritten signature in cursive script that reads "Susan D. Mackert".

Susan D. Mackert
Environmental Specialist II Senior

Enclosure: Site Visit Memorandum

MEMORANDUM
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
NORTHERN REGIONAL OFFICE

13901 Crown Court

Woodbridge, VA 22193

SUBJECT: Broad Run Water Reclamation Facility

TO: No Exposure File

FROM: Susan Mackert

DATE: November 23, 2009

COPIES: Mr. Robert Canham – Manager
VA0091383 – File

A site visit was performed on November 17, 2009, to verify information provided in a no exposure certification received on June 29, 2009. Information provided in the no exposure certification was found to be accurate and representative of actual site conditions.

The facility operates under SIC Code 4952 (sewerage systems) which falls under Sector T – Treatment Works. The following are noted:

- The facility is an advanced wastewater treatment plant with a design flow of 22 MGD. The facility is currently operating under a 5.5 MGD flow tier.
- The facility comprises approximately 40 acres and is primarily flat with paved and grass covered surfaces (photos 1 - 3).
- A small bioretention pond is located at the front of the facility near the administration building (photo 4). This retention pond receives runoff from the adjacent parking lot (photo 5).
- All treatment processes, including sludge handling, are covered. As such, there is no potential for storm water contamination (photos 1 - 3).
- Maintenance is conducted inside within a dedicated maintenance shop.
- Heavy equipment is stored inside. Some smaller pieces of equipment are stored outside, but under cover (photo 6).
- Chemical offloading is conducted in a dedicated area with a dual trench drain system (photo 7). All chemicals stored in this area are within secondary containment (photo 8). There is no potential for storm water contamination.
- Roof drainage from the liquids building is returned to the headworks of the plant.
- All storm water from within the operational area of the plant drains to a storm water pond (photo 9) which then flows to a larger bioretention pond.

Based on observations from the site visit, there is no significant impact on storm water quality from the facility and as such, the facility can claim no exposure at this time. A VPDES General Permit for Storm Water Discharges Associated with Industrial Activity is not needed at this time for the Broad Run Water Reclamation Facility located on Loudoun Water Way in Ashburn. However, the facility was advised that coverage may be necessary at a later date should changes to regulations be implemented or site activities change.

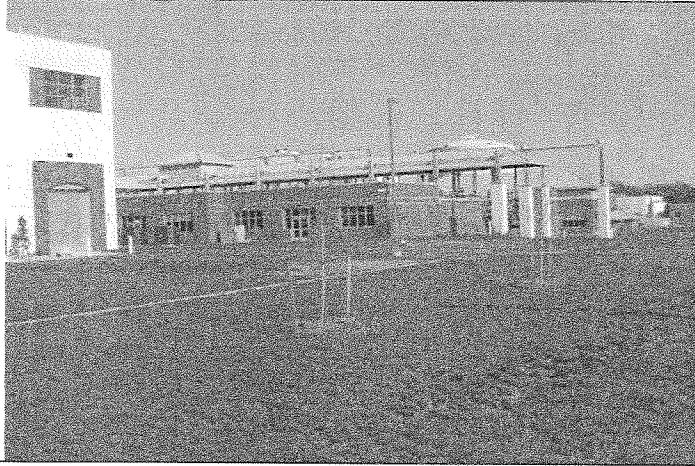


Photo 1. Broad Run Water Reclamation Facility.



Photo 2. Broad Run Water Reclamation Facility.

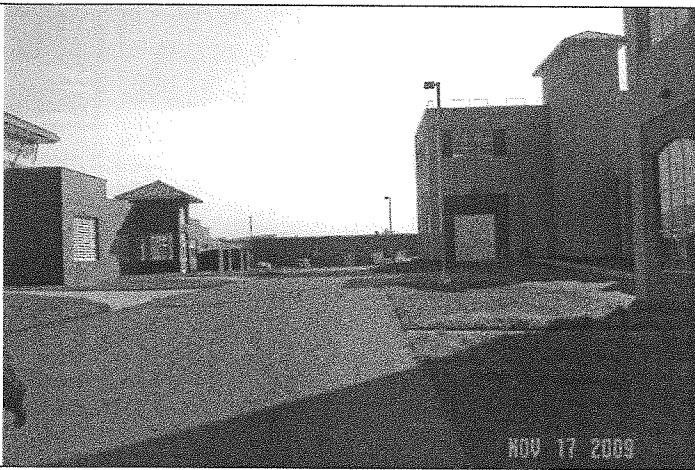


Photo 3. Broad Run Water Reclamation Facility.

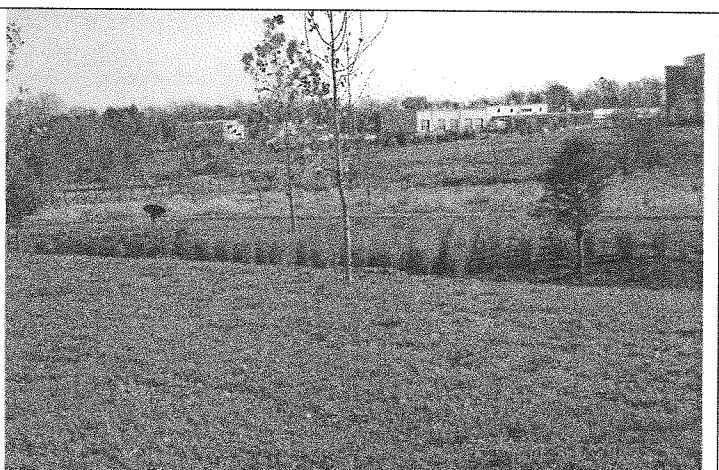


Photo 4. Small bioretention pond near administration building.



Photo 5. Area at front of administration facility that drains to the bioretention pond shown in Photo 4. Flow is in the direction of the arrow.



Photo 6. Smaller pieces of equipment stored under cover.

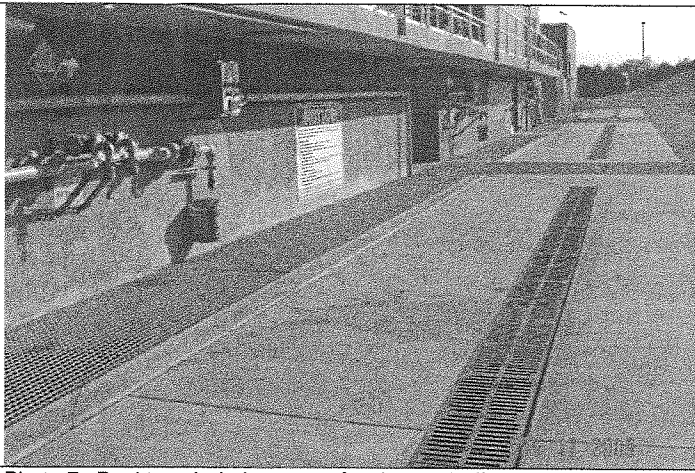


Photo 7. Dual trench drain system for chemical offloading.

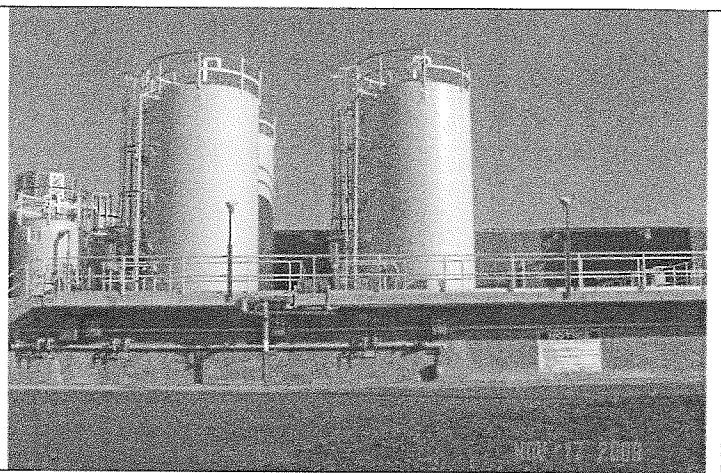


Photo 8. Chemical storage within secondary containment.

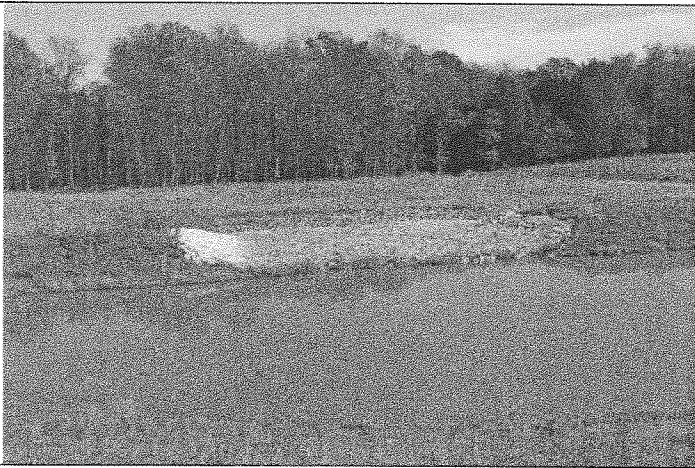
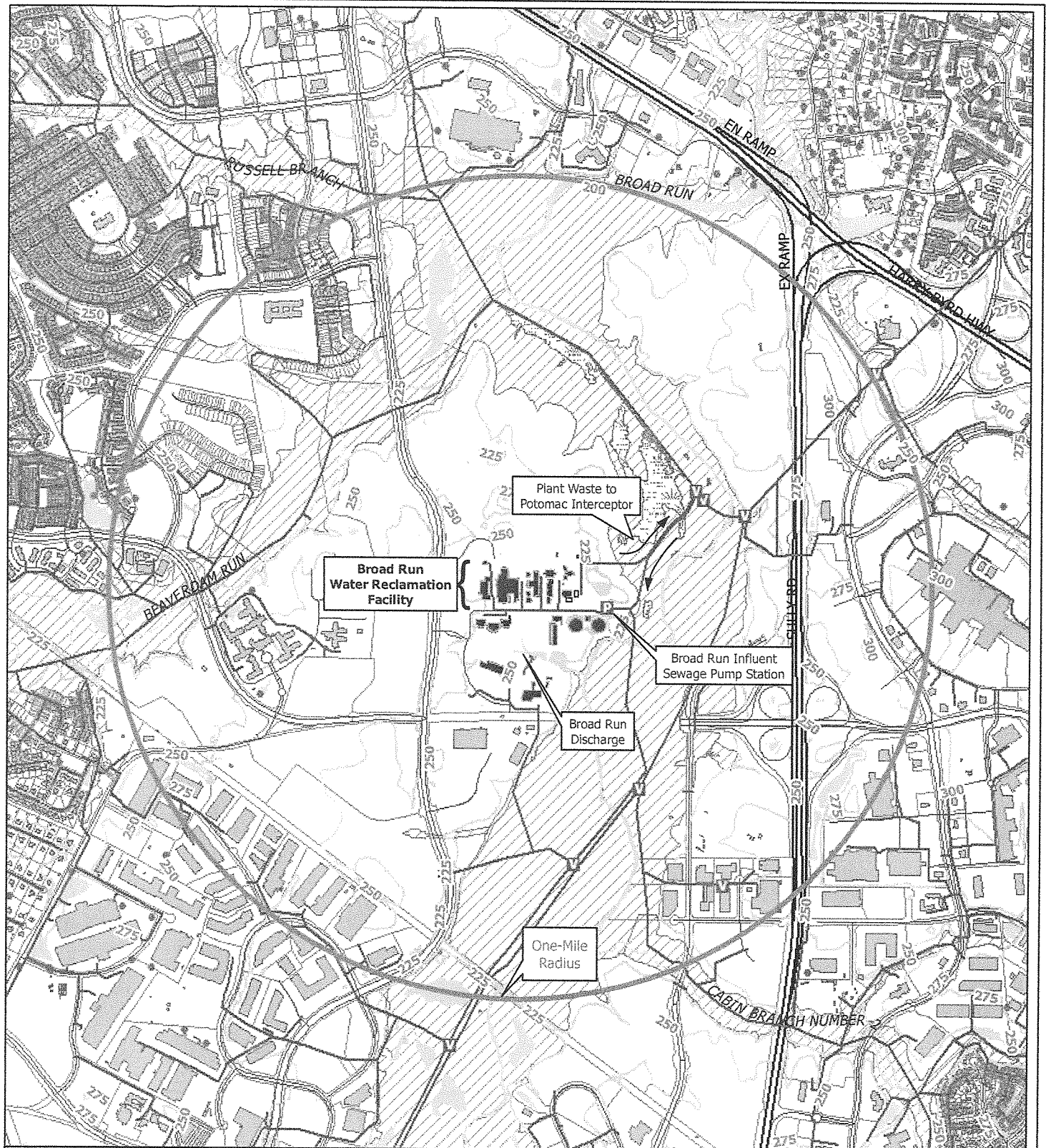


Photo 9. Storm water retention pond that receives runoff from operational area of plant.

ATTACHMENT 4



LOUDOUN WATER

These data are confidential and may not be copied or distributed without Loudoun Water's permission. Water and wastewater data are the property of Loudoun Water. Base map data are the property of Loudoun County Office of Mapping and Geographic Information (all rights reserved). These data and all maps thereby derived are considered best available information and are provided "as is" without warranties of any kind, either expressed or implied, including but not limited to warranties of suitability to a particular purpose or use.

V:\GIS\Projects\Broad_Run_WRF\MXD\PermitRenewal2015.mxd
Date Created: 1/29/15 by JRH

Legend

- | | |
|-------------------|----------------|
| 1 Mile Radius | Buildings |
| Vault | Parcels |
| Pump Station | Major Road |
| Vault | Road |
| Pump Station | Wells |
| Gravity Main | Stream |
| Wetland | 25 Ft Contours |
| 100 Yr Floodplain | |



0 500 1,000 2,000 Feet

Broad Run Water Reclamation Facility

2015 VPDES
Permit Re-Issuance

Attachment 1

January 2015

ATTACHMENT 5

SPILL CONTROL PLAN

SCOPE Spill control, cleanup, and reporting procedures are applicable to all Broad Run WRF activities and operations. These procedures are specific to Broad Run WRF and may require modification for use at other Loudoun Water locations.

PURPOSE To ensure that all sewage, oil, and chemical spills are reported to the appropriate authority as required by law.

PROCEDURE

1. When the potential for a spill exists, programs are to be established to prevent the escape of hazardous materials. This should include identifying areas where there are potential risks for spills, adopting procedures and technologies to minimize or eliminate such risks, and ensuring all personnel involved are trained in the procedures and technologies.
2. In the event of a spill or release of material, persons in the immediate area should act to ensure their personal safety. The responsible person must act quickly to stop, contain, minimize the effects of and clean up the affected area, where possible and safe – this may include initiating an Emergency Response (911).
3. Identify the material and the quantity spilled.
4. The responsible person must determine if the spill is reportable and which agencies require notification.
5. The responsible person must notify all applicable agencies immediately and complete the appropriate Spill Reporting Form.

IDENTIFYING HAZARDS

The hazards posed by a spill of a particular substance are detailed on the Material Safety Data Sheet. In some cases the MSDS will even tell you what to use or what not to use, to contain or cleanup the substance.

As with all work with hazardous materials, depend on the labels and MSDS to keep you informed about potential hazards and protective measures. When there is a possibility of a spill, you have to be especially alert to reactions: what could happen if the particular substance comes in contact with another chemical or with air or water. Some substances that are not a risk high on their own can be real disasters if they react with the wrong thing.

SAFETY PROCEDURES

1. Notify the appropriate personnel immediately if you see a spill. Report what is leaking and where to your immediate supervisor, as well as the size of the spill and rate of flow.

The supervisor will tell you whether you can clean it up or if it should be left up to trained people. If the spill is of significant size, the Safety Specialist will also be notified.

2. Evacuate the area if you are not trained for and assigned to spill containment. Alert other workers to get out also.
3. Review the MSDS to be sure you understand what you are working with, what its hazards are, and what to do to contain it.
4. Use proper personal protective equipment.
 - a. Stop the source of the leak. Close the valves, pumps, or whatever may be allowing material out.
 - b. Contain the spill by the best method. That might be: Building a dike to keep spilled liquid from getting into the water. Repairing the container or putting it in a container that will not leak. Channeling the spill to a place where it will not spread, by diking or pumping, or opening a trench to secure a spot. Placing an empty container under the leak. Rotating or shifting the container's position to stop the leak.
 - c. Cover drains or other possible escape routes.
 - d. Patch holes with patch kits, valve plugs, or whatever is needed.
 - e. Use absorbent materials to soak up the spill or to solidify it.
 - f. Push the absorbent – liquid mixture into an EPA approved container for proper disposal.
5. Decontaminate. Your protective clothing as well as any brooms, shovels, or other tools used for the job have to be decontaminated or disposed of in an EPA approved container.

SPILL RESPONSE QUICK CHECK LIST	INITIALS
Report spills immediately	
Evacuate the area if you're not responsible for spill cleanup	
Check the substances MSDS for hazards, reactivity, and proper protective equipment, etc.	
Put on protective clothing	
Stop the source of the spill if possible	
Cover drains or other possible escape routes	
Try to contain the spill	
Soak up or solidify the spill with absorbent materials	
Decontaminate protective clothing, tools and any other equipment that was used and dispose of them properly	

SUGGESTED MATERIALS TO HAVE ON HAND

- Material Safety Data Sheets
- Spill containment materials (brooms, pads, absorbents, spill kits)

- Personal Protective Equipment

GENERAL HAZARDS

- Fire
- Explosion
- Hazardous substances entering the water supply
- Hazardous substances released to air
- Contamination of individuals who come in contact with the spilled substance.

PROCEDURE FOR A SEWAGE SPILL OR OVERFLOW

1. For spills on land, wastewater treatment plant operators are **required** to isolate the affected spill area using caution tape, temporary fencing, or some other means. The operator shall vector or rake up as much of the spill as possible. Applying a layer of lime to the effective area raises the pH and is effective in reducing the pathogen levels. Lime application may also assist with raking up the remaining residual of the spill.
2. For spills or overflows inside buildings, isolate the area first and stop the spill as soon as possible. Have atmospheric monitor with you to make sure there are no dangerous gasses present. Immediately hose down floor and equipment that was contaminated. Use caution around electrical equipment. Using a water hose or squeegee, move sewage to an available floor drain and make sure you flush out drain afterwards so no sewer gas will be present. Solids as grit or rags should be separated and disposed of in the appropriate containers or hoppers. The affected area should be disinfected with a cleaner as the final cleanup step.
3. For Biosolids spill on site, all Biosolids must be returned to an appropriate container, hopper, or truck. The roadway shall be cleaned with water to remove any material and any affected soil should be raked and limed. Inside spills should be cleaned up, disposed of in an appropriate container and floors hosed down.
4. Notify Safety Specialist of major spills.

REPORTING

1. Report spills or surcharges to the Operations Supervisor. Department of Environmental Quality will also need contacting if surcharge is to land at 703-583 3800. (Northern VA Office)
2. The following information needs to be reported:
 - a. Your name, title, employer, and phone number
 - b. Location of spill
 - c. Cause of spill (e.g., broken sewer line, malfunctioning lift station, ect.)
 - d. Duration of spill (start and stop dates and times)
 - e. Estimated number of gallons spilled
 - f. Public or private properties potentially impacted by spill
 - g. Surface/groundwater bodies impacted or potentially impacted by spill

- h. Estimated date and time of completion of repair
- i. Steps taken to contain or decontaminate the spill

TABLE 1 – POTENTIAL SOURCES OF A SEWAGE OR BIOSOLIDS SPILL

No.	Location	Description
1.	Septage Facility	Leaks and spills during unloading
2.	Influent Sewage Pump Station Manhole No. 13	Plant drain flow excessive
3.	Manhole No. 5 from Influent Sewage Pump Station to Interceptor	Surcharges if Influent Sewage Pump Station goes down
4.	Coarse screens	Degritter clogged, overfill containers (grit) Effluent gate closed high alarm fails
5.	Fine screens	Overfill containers (rags, scum) Effluent gate closed
6.	Solids Handling building	Centrifuges
7.	Solids Handling building	Overfill sludge containers
8.	Digester	Sludge spilled downstairs (sampling valve left open)
9.	Plant Roadway	Spills from trucks hauling Biosolids
10.	Biological Reactor Basins	Spills from hoses and trucks while seeding
11.	All Samplers	Ruptured hoses, container spills
12.		
13.		
14.		

TABLE 2 - LOCATION OF SEWAGE AND BIOSOLIDS SPILL EQUIPMENT

Equipment	Location	Contact Person	Phone Number
Personal Protective Equipment Kits	Maintenance Bay	Lenny McDonald	703-623-7559
Shovel, rakes	Maintenance bay Storage on site	Ray Kirkpatrick Curt Moore	703-623-7064 571-246-5160

		Mike Rumke	703-717-1859
Bags of lime	Maintenance bay	Ray Kirkpatrick Curt Moore	703-623-7064 571-246-5160
Front end loader	Maintenance (Bobcat)	Ray Kirkpatrick Curt Moore	703-623-7064 571-246-5160
Sweeper	Maintenance (Bobcat)	Ray Kirkpatrick Curt Moore	703-623-7064 571-246-5160
Flush truck	O and M	Pete Lanham	571-291-7760

PROCEDURE FOR AN OIL SPILL AND CLEANUP

1. When a spill occurs on the Broad Run WRF, the employee shall note the time of the incident and estimate the number of gallons spilled.
2. The employee shall take immediate steps to prevent vehicle and/or pedestrian traffic from moving through the area (setting up cones, safety tape, etc).
3. Priority should be given to preventing the oil from entering any storm water system, sanitary sewer system, streams, or rivers by using of brooms and/or pillows.
4. Response and cleanup should be considered an urgent priority.
5. For small spills, Speedy-Dry/Stay Dry type of material is the most common material used in a clean up. Use plenty and enough so that no liquid can be squeezed from it.
6. Once a spill is soaked up/dried up, the Speedy-Dry can go to the landfill. Again, **no liquid may be present.** A general cleanup of the area will then proceed.
7. Large spill that cannot be totally absorbed with Speedy-Dry must be placed in a hazard material drum, properly labeled and transported to an incineration plant/hazardous landfill for proper disposal.
8. Spills that have entered a storm water system, sanitary sewer system, stream or holding pond will have to be addressed with brooms and pillows.

NOTIFICATION AND RECORD KEEPING

1. All spills must be recorded and reported to the Operations Supervisor.
2. Spills over **25 gallons** must be reported to Operations Supervisor (Cell No. 703-717-1859) and the Virginia Department of Environmental Quality (DEQ) at 703-583-3800. (Northern VA Office)
3. Records of all spills must be kept on file for 5 years.
4. All spills, **regardless of size**, that enter streams and/or rivers must be reported to DEQ.

NOTE

- MSDS
- Personal Protective Equipment
- Stop the leak, first if it can be done from SCADA or with out contact to substance
- Contain the spill
- Soak it up
- Clean it up
- Do the paper work

TABLE 3 - POTENTIAL SOURCES FOR AN OIL SPILL AND CLEANUP

NO.	LOCATION	DESCRIPTION
1.	Generator fuel tanks	3 -12,000 gal. fuel tanks, leaks and spills during filling
2.	Electrical room	Fuel line or pump may break or rupture, 100 gallon day tank may leak
3.	Electrical room	Anti-Freeze from radiators
4.	Maintenance shop	Equipment leaking , containers stored outside
5.		

TABLE 4 - LOCATION OF OIL SPILL KITS AND ABSORBENTS

LOCATION	NUMBER OF KITS AND BAGS
Chemical Building	3 – 95 gallon Overpack Spill Kits
Methanol Building	1 – 95 Gallon Overpack Spill Kit
Septage Building	1 – 95 Gallon Overpack Spill Kit
Fine Screen/Coarse Screen truck bays	1 – 95 Gallon Overpack Spill Kit per bay
Thickening and Dewatering Building truck bay	1 – 95 Gallon Overpack Spill Kit
Digester Building	1 – 95 Gallon Overpack Spill Kit
Electrical Building	1 – 95 Gallon Overpack Spill Kit

INDIVIDUAL RESPONSIBILITIES

1. Become familiar with the hazards of chemical products before using them.
2. Use preventive measures to minimize the likelihood of spills, such as using secondary containers when transporting chemicals and placing absorbent materials on work surfaces.
3. Receive training as needed

4. Assess the need for spill control materials
5. Clean up small spills properly
6. Report all spills to supervisor immediately

PROCEDURE FOR A CHEMICAL SPILL

1. Immediately alert others in the area and the immediate supervisor; evacuate the area if necessary.
2. For a major chemical spill, the National Response Center needs to be notified at 1-800-424-8802.
3. If there is a fire or medical attention is needed, contact the appropriate EMS personnel.
4. Attend to any persons who may be contaminated. Contaminated clothing must be removed immediately and the skin flushed with water for no less than 15 minutes.
5. If a volatile, flammable material is spilled, immediately warn others in the area, control sources of ignition, and ventilate the area.
6. Wear personal protective equipment, as appropriate to the hazards. Refer to your MSDS or other reference available for information.
7. If the spill is a major one, if there has been a release to the environment, or if assistance is needed, contact the appropriate EMS personnel. (phone numbers in the control room)
8. Consider the need for respiratory protection. The use of a respirator or self contained breathing apparatus requires specialized training and medical surveillance. Never enter a contaminated atmosphere without protection or use of a respirator without training.
9. Protect floor drains or other means for environmental release. Spill socks and absorbents may be placed around drains, as needed.
 - Loose spill control materials should be distributed over the entire spill area, working from the outside, circling to the center. This reduces the chance of splash or spreading of the spilled chemical.
10. When the spilled materials have been absorbed, use a brush and scoop (spark resistant if flammable materials are involved) to place materials in an appropriate container. Polyethylene bags may be used for small spills. Five-gallon pails or 20-gallon drums with polyethylene liners may be appropriate for larger spills.
11. Complete a hazardous waste tag, identifying the material as Spill Debris involving the chemical, and affix the sticker to the bag or container.
12. Place the container in a well-ventilated area until pick up is arranged.
13. Decontaminate surfaces involved in the spill using a mild detergent and water, as appropriate.
14. When polymer spills occur, try to maintain containment in the smallest area possible because the consistency of the chemical is very treacherous to walk on. If possible, use hot water and a pressure washer to give the affected floor area a final cleaning. Polymer containment also has a mud valve to open if you want to send the spill to Waste Basin.

TABLE 5 - INVENTORY OF CHEMICALS USED BY OPERATIONS AT BROAD RUN WRF

NO.	LOCATION	CHEMICAL	NO. OF TANKS	CAPACITY PER TANK GALLONS	SPILL CONTAINMENT CAPACITY GALLONS
1.	Chemical Building	Citric Acid	2	2,800	4,200
2.	Chemical Building	Ferric Chloride	2	22,000	33,000
3.	Chemical Building	Alum	2	22,000	33,000
4.	Chemical Building	Sodium Hypochlorite	2	17,000	25,500
5.	Chemical Building	Sodium Hydroxide	2	22,000	33,000
6.	Methanol Building	Methanol	2	15,200	22,000
7.	Solids Building	Polymer	totes	250-330 per tote	1500
8.	Coarse Screens	Polymer	totes	250-330 per tote	none
9.	Solids and Digester Bld	Glycol 35% dilution	n/a	12,000 gal. in system	n/a
10.	Carbon Building	Carbon	1,690	1,000 bags	none
11.					

TABLE 6 - POTENTIAL SOURCES FOR A CHEMICAL SPILL

LOCATION	DESCRIPTION
Chemical Building outside	Leaks or spills during filling of tanks (6,000 gallon Spill capacity for Acids and Caustics)
Chemical Building inside	Ruptured line or leak
Methanol Building	Leaks during filling of tanks (6,000 gallon Spill capacity at unloading area.)
Methanol Building	Ruptured line or leak
Chemical Trench	Ruptured line or leak
Chemical lines in coarse and fine screening	Ruptured line or leak
Chemical lines in BRB and membrane rooms	Ruptured line or leak
Chemical lines in Septage, Influent Sewage Pump Station, and Carbon buildings	Ruptured line or leak
Solids Handling and Coarse Screens	Polymer tote or line leaking
Centrifuges	Leak in polymer line

Solids Handling and Digester Buildings	Leak in Glycol line or pump
Carbon Building	Loading Carbon Cells

TABLE 8 – IMPLEMENTATION SCHEDULE

No.	Item	Date
1.	<u>Chemical Building</u> : Place spill kit and Personal Protective Equipment	
2.	<u>Electrical Building</u> : Place spill kit and Speedy Dry for fuel tanks	
3.	<u>Septage Receiving</u> : Place several bags of lime and spill kit	
4.	<u>Maintenance Shop</u> : Place spill kit	
5.	<u>Influent Sewage Pump Station</u> : Place several bags of lime	
6.	<u>Methanol Building</u> : Spark resistant tools for cleanup of absorbed materials.	
7.	<u>Solids Handling</u> : Place spill kit for glycol leak	
8.	<u>BRB Building</u> : Place several bags of lime temporarily for seeding process	
9.		
10.		
11.		

TABLE 9 – IMPLEMENTATION RESPONSIBILITIES

No.	Item	Responsible Staff
1.	Chemical Building	
2.	Electrical building	
3.	Septage Receiving	
4.	Maintenance shop	
5.	Influent Sewage Pump Station	
6.	Methanol building	
7.	Solids Handling building	
8.	BRB building	
9.		
10.		
11.		
12.		

TABLE – 10 CHEMICALS USED BY BRWRF STAFF

Z:\SOP\TOPs\BRWRF Spill Control Plan.docx

1. Sodium Bicarbonate
2. Clorox Regular Bleach
3. Neutral Disinfectant and Detergent
4. Calibration Gas (Methane, Carbon Monoxide, Oxygen)
5. Silicone rubbing compound
6. Hypochlorite disinfecting tablets
7. Sodium Hydroxide

ATTACHMENT 6



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

NORTHERN REGIONAL OFFICE

Molly Joseph Ward
Secretary of Natural Resources

13901 Crown Court, Woodbridge, Virginia 22193
(703) 583-3800 Fax (703) 583-3821
www.deq.virginia.gov

David K. Paylor
Director

Thomas A. Faha
Regional Director

March 24, 2015

Dale Hammes
General Manager
P.O. Box 4000
Ashburn, VA 20146

Re: Broad Run WRF, Permit #VA0091383

Dear Mr. Hammes:

Attached is a copy of the Inspection Report generated from the Facility Technical Inspection conducted at Broad Run - Water Reclamation Facility (WRF) on February 25, 2015. The compliance staff would like to thank you for your assistance during this inspection. This letter is not intended as a case decision under the Virginia Administrative Process Act, Va. Code § 2.2-4000 *et seq.* (APA).

Please review the enclosed report and submit in writing adequate documentation of all measures taken (including all necessary supporting documentation) to address the Request for Corrective Action no later than **April 24, 2015**.

Your response may be sent either via the US Postal Service or electronically, via E-mail. If you choose to send your response electronically, we recommend sending it as an Acrobat PDF or in a Word-compatible, write-protected format. Additional inspections may be conducted to confirm that the facility is in compliance with permit requirements.

If you have any questions or comments concerning this report, please feel free to contact me at the Northern Regional Office at (703) 583-3882 or by e-mail at Sharon.Allen@deq.virginia.gov.

Sincerely,

A handwritten signature in black ink that reads "Sharon Allen". The script is cursive and fluid, with the first letters of "Sharon" and "Allen" being capitalized and prominent.

Sharon Allen
Environmental Specialist II

Electronic copy sent:

Permits / DMR File, Compliance Manager, Compliance Auditor – DEQ
Mike Rumke –Superintendent WRF, Production

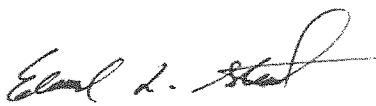
DEQ
WASTEWATER FACILITY INSPECTION REPORT
 PREFACE

VPDES/State Certification No.	(RE) Issuance Date	Amendment Date	Expiration Date
VA0091383	August 25, 2010		August 24, 2015
Facility Name	Address		Telephone Number
Broad Run Water Reclamation Facility	44961 Loudoun Water Way Ashburn, VA 20146		(571)291-7823
Owner Name	Address		Telephone Number
Loudoun Water	P.O. Box 4000 Leesburg, VA 20146		(571)291-7823
Responsible Official	Title		Telephone Number
Dale Hammes	General Manager		(571)291-7980
Responsible Operator	Operator Cert. Class/number		Telephone Number
Mike Rumke	Class I / 1965008034		(571) 291-7826
TYPE OF FACILITY:			
DOMESTIC		INDUSTRIAL	
Federal		Major	X
Non-federal	X	Minor	
INFLUENT CHARACTERISTICS:		DESIGN:	
	Flow	11 MGD	
	Population Served	~60,000	
EFFLUENT LIMITS: mg/L unless otherwise specified			
Parameter	Min.	Avg.	Max.
pH, S.U.	6.0		9.0
Turbidity, NTU		0.5	
COD		10	15
TKN		1.0	1.5
NO₂+NO₃ (as N)		NL	NA

Once/3 months							
Parameter	Min.	Avg.	Max.	Parameter	Min.	Avg.	Max.
Total Hardness		NL	NL	Dissolved Copper		NL	NL
Dissolved Zinc		NL	NL	Di-2-EthylHexyl Phthalate (µg/L)		NL	NL
Chronic Toxicity, <i>C. dubia</i> (TU _c)		NA	NL	Chronic Toxicity, <i>P. promelas</i> (TU _c)		NA	NL
	Receiving Stream			Broad Run			
	Basin			Potomac River			
	Discharge Point (LONG)			77°26'39"			
	Discharge Point (LAT)			39°01'50"			

DEQ**WASTEWATER FACILITY
INSPECTION REPORT
PART 1**Inspection date: **February 26, 2015**Date form completed: **March 20, 2015**Inspection by: **S. Allen**Inspection agency: **DEQ**Total Time Spent: **40 hours**Announced: **No**

Reviewed by:

Scheduled: **Yes**Present at inspection: **Mike Rumke - Loudoun Water
Lisa Janovsky, Martin Robinson, Amy Dooley - DEQ**

TYPE OF FACILITY:

Domestic**Industrial**☐ Federal☒ Major☐ Major☐ Primary☒ Nonfederal☐ Minor☐ Minor☐ Secondary

Type of inspection:

☒ Routine☐ Compliance/Assistance/Complaint☐ ReinspectionDate of last inspection: **July 8, 2012**Agency: **DEQ NRO**Population served: **approx. 60,000**Connections served: **approx. 26,500**Last month: (Effluent) from eDMR February **2015**

Flow	3.6	MGD		DO	8.4	mg/L		pH	6.7-7.2	s.u.
Turbidity	0.08	NTU		COD	<QL	mg/L		TSS	<QL	mg/L
E. coli	<2	n/100ml		NO ₂ -NO ₃	1.08	mg/L		TKN	0.46	mg/L
TN	1.54	mg/L		TP	<QL	mg/L				

Quarterly average: (Effluent) **Oct – Dec 2014**

Flow	4.9	MGD		DO	8.4	mg/L		pH	7.1	s.u.
Turbidity	0.07	NTU		COD	0.88	mg/L		TSS	<QL	mg/L
E. coli	<QL	n/100ml		NO ₂ -NO ₃	3.95	mg/L		TKN	0.48	mg/L
TN	4.43	mg/L		TP	0.04	mg/L				

DATA VERIFIED IN PREFACE

☒ Updated ☐ No changes

Has there been any new construction?

☒ Yes☐ No

If yes, were plans and specifications approved?

☒ Yes☐ No☐ NA

DEQ approval date:

Reclaim pump tank and distribution system – CTO issued January 14, 2015

(A) PLANT OPERATION AND MAINTENANCE

1. Class and number of licensed operators: **I - 8, II - 0, III - 3, IV - 3**
2. Hours per day plant is manned: **24 hours per day, 7 days per week**
3. Describe adequacy of staffing. ☐ Good ☒ Average ☐ Poor
4. Does the plant have an established program for training personnel?
☒ Yes ☐ No
5. Describe the adequacy of the training program. ☒ Good ☐ Average ☐ Poor
6. Are preventive maintenance tasks scheduled? ☒ Yes ☐ No
7. Describe the adequacy of maintenance. ☒ Good ☐ Average ☐ Poor*
8. Does the plant experience any organic/hydraulic overloading?
If yes, identify cause and impact on plant: ☐ Yes ☒ No
9. Any bypassing since last inspection? ☐ Yes ☒ No
10. Is the standby electric generator operational? ☒ Yes ☐ No* ☐ NA
11. Is the STP alarm system operational? ☒ Yes ☐ No* ☐ NA
12. How often is the standby generator exercised?
Power Transfer Switch? **Electrician exercises the generator once per month, under load a couple of times per year**
Alarm System? **Once per week**
Once per week
13. When was the cross connection control device last tested on the potable water service? **April 17, 2015**
14. Is sludge being disposed in accordance with the approved sludge disposal plan? ☒ Yes ☐ No ☐ NA
15. Is septage received by the facility? ☒ Yes ☐ No
Is septage loading controlled? ☒ Yes ☐ No
Are records maintained? ☒ Yes ☐ No
16. Overall appearance of facility: ☒ Good ☐ Average ☐ Poor

Comments:

- 7. Eight maintenance staff are available; usually two at BRWRF; others now also work at community systems plants.**
- 12. Plant has ~12,000 alarms throughout facility –reported to SCADA**
- 15. Loads are spot checked for pH, color, odor - records kept at lab.**

(B) PLANT RECORDS

1. Which of the following records does the plant maintain?

Operational Logs for each unit process	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Instrument maintenance and calibration	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Mechanical equipment maintenance	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Industrial waste contribution (Municipal Facilities)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> NA

2. What does the operational log contain?

<input checked="" type="checkbox"/> Visual observations	<input checked="" type="checkbox"/> Flow measurement
<input type="checkbox"/> Laboratory results	<input checked="" type="checkbox"/> Process adjustments
<input type="checkbox"/> Control calculations	<input type="checkbox"/> Other (specify)

Comments:

3. What do the mechanical equipment records contain?

<input checked="" type="checkbox"/> As built plans and specs	<input type="checkbox"/> Spare parts inventory
<input checked="" type="checkbox"/> Manufacturers instructions	<input checked="" type="checkbox"/> Equipment/parts suppliers
<input checked="" type="checkbox"/> Lubrication schedules	<input type="checkbox"/> Other (specify)

Comments:

4. What do the industrial waste contribution records contain **NA**
(Municipal Only)?

<input type="checkbox"/> Waste characteristics	<input type="checkbox"/> Locations and discharge types
<input type="checkbox"/> Impact on plant	<input type="checkbox"/> Other (specify)

Comments:

5. Which of the following records are kept at the plant and available to personnel?

<input checked="" type="checkbox"/> Equipment maintenance records	<input checked="" type="checkbox"/> Operational Log
<input type="checkbox"/> Industrial contributor records	<input checked="" type="checkbox"/> Instrumentation records
<input checked="" type="checkbox"/> Sampling and testing records	

6. Records not normally available to plant personnel and their location: **N/A**

7. Were the records reviewed during the inspection? ☒ Yes ☐ No

8. Are the records adequate and the O & M Manual current? ☒ Yes ☐ No

9. Are the records maintained for the required 3-year time period? ☒ Yes ☐ No

Comments:

(C) SAMPLING

1. Do sampling locations appear to be capable of providing representative samples? ☒ Yes ☐ No*
2. Do sample types correspond to those required by the VPDES permit? ☒ Yes ☐ No*
3. Do sampling frequencies correspond to those required by the VPDES permit? ☒ Yes ☐ No*
4. Are composite samples collected in proportion to flow? ☒ Yes ☐ No* ☐ NA
5. Are composite samples refrigerated during collection? ☒ Yes ☐ No* ☐ NA
6. Does plant maintain required records of sampling? ☒ Yes ☐ No*
7. Does plant run operational control tests? ☒ Yes ☐ No

Comments:

(D) TESTING

1. Who performs the testing? ☒ Plant ☒ Central Lab ☒ Commercial Lab

Name: **Operators - field parameters: pH, DO, TRC, Turbidity**
Certified on-site lab – COD, TSS, *E. coli*, nutrients
Pace Environmental – metals, hardness, TDS, Di-2-EthylHexyl Phthalate

If plant performs any testing, complete 2-4.

2. What method is used for chlorine analysis? **Hach Pocket Colorimeter**
3. Does plant appear to have sufficient equipment to perform required tests? ☒ Yes ☐ No*
4. Does testing equipment appear to be clean and/or operable? ☒ Yes ☐ No*

Comments:

TRC monitoring not yet required under Reuse provisions in permit.**(E) FOR INDUSTRIAL FACILITIES WITH TECHNOLOGY BASED LIMITS ONLY**

1. Is the production process as described in the permit application? (If no, describe changes in comments)
☐ Yes ☐ No ☒ NA
2. Do products and production rates correspond as provided in the permit application? (If no, list differences)
☐ Yes ☐ No ☒ NA
3. Has the State been notified of the changes and their impact on plant effluent? Date:
☐ Yes ☐ No* ☒ NA

Comments:

Problems identified at last inspection:

Corrected

Not Corrected

- | | | |
|---|------------|------------|
| 1. DEQ requests that the results of daily compliance analyses be supplied as an attachment to the monthly eDMR in order to facilitate data review. This attachment should contain the final effluent results only, with QA/QC documentation kept on site and available upon request. | [] | [X] |
| 2. Please supply the date of the most recent cross connection testing and certification for devices located at the WRF | [X] | [] |
-

SUMMARY**COMMENTS:**

- **When we checked the septage receiving station, we discovered that water was not draining from the auger/classifier into the plant as supposed to, but being dumped into the dumpster that normally collects the rags (photo 8). Mr. Rumke called one of the operators over to find out what the problem was; found out drain line was blocked with grease. Mr. Rumke said the blockage had been cleared and unit functioning normally when DEQ left the facility at 3:40pm.**
- **The plant and grounds were neat and orderly.**

REQUEST for CORRECTIVE ACTION:

- **During this inspection, the gas monitors in the Influent pump station, Coarse Screen Room, Fine Screen Room, and Biosolids building were in alarm. Mr. Rumke stating that they were waiting for parts for these monitors. Inform DEQ once the gas meters have been repaired and are functioning normally.**
- **Address the documentation issues noted in the laboratory section of this report and provide a written resolution.**

UNIT PROCESS: Sewage Pumping

1. Name of station: **Influent Pump Station**
2. Location (if not at STP):
3. Following equipment operable:
- | | | | |
|----------------------|---|------------------------------|--|
| a. all pumps | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | |
| b. ventilation | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | |
| c. control system | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | |
| d. sump pump | <input type="checkbox"/> Yes | <input type="checkbox"/> No* | <input checked="" type="checkbox"/> NA |
| e. seal water system | <input type="checkbox"/> Yes | <input type="checkbox"/> No* | <input checked="" type="checkbox"/> NA |
4. Reliability considerations:
- | | | | |
|---|---|--|--------------------------------|
| a. Class | <input checked="" type="checkbox"/> I | <input type="checkbox"/> II | <input type="checkbox"/> III |
| b. Alarm system operable: | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | |
| c. Alarm conditions monitored: | | | |
| 1. high water level | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | |
| 2. high liquid level in dry well | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> NA |
| 3. main electric power | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> NA |
| 4. auxiliary electric power | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> NA |
| 5. failure of pump motors to start | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> NA |
| 6. test function | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | |
| 7. other | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | |
| d. Backup for alarm system operational: | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> NA |
| e. Alarm signal reported to (identify): | Control room via SCADA | | |
| f. Continuous operability provisions: | | | |
| <input checked="" type="checkbox"/> generator | <input type="checkbox"/> two sources of | | |
| <input type="checkbox"/> portable pump | <input type="checkbox"/> 1 day storage | | <input type="checkbox"/> other |
5. Does station have bypass:
- | | | | |
|------------------------------|-------------------------------|--|--|
| a. evidence of bypass use | <input type="checkbox"/> Yes* | <input checked="" type="checkbox"/> No | |
| b. can bypass be disinfected | <input type="checkbox"/> Yes* | <input type="checkbox"/> No | <input checked="" type="checkbox"/> NA |
| c. can bypass be measured | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> NA |
6. How often is station checked? **Twice each shift**
7. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

3. Six pumps, three are scheduled for impeller replacement. Two force mains send water to the screening/grit facilities.

5. Operators have ability to divert flow from BRWRF and send it to Blue Plains Interceptor.

UNIT PROCESS: Flow Equalization

1. Type: ☐ In-line ☒ Side-line ☐ Spill pond Number of cells: **2**
2. What unit process does it precede? **Fine screens**
3. Is volume adequate? ☒ Yes ☐ No
4. Mixing: ☒ None ☐ Diffused air ☐ Fixed mechanical ☐ Floating mechanical
5. Condition of mixing equipment: ☐ Good ☐ Average ☐ Poor ☒ NA
6. How drawn off?
 A. Pumped from: ☐ Surface ☒ Sub-surface ☐ Adjustable
 B. Weir ☐ Surface ☐ Sub-surface
7. Is containment structure in good condition? ☒ Yes ☐ No
8. Are the facilities to flush solids and grease from basin walls adequate?
☒ Yes ☐ No ☐ NA
9. Are there facilities for withdrawing floating material and foam?
☐ Yes ☒ No
10. How are solids removed? ☒ Drain down ☐ Drag line ☐ NA ☐ Other
 Is it adequate? ☒ Yes ☐ No
11. Is the emergency overflow in good condition? ☒ Yes ☐ No ☐ NA
12. Are the depth gauges in good condition? ☒ Yes ☐ No ☐ NA

Comments:

- 1. Two EQ tanks – use one as “clean” to hold permeate water. The other is “dirty” to hold water after screening (screened primary effluent) for diurnal flow control. Tanks are drained, cleaned, and switched every 3 months**

UNIT PROCESS: Screening/Comminution – Coarse Screens

1. Number of Units: Manual: **0** Mechanical: **3**
 Number in operation: Manual: **0** Mechanical: **2**
2. Bypass channel provided: ☐ Yes ☒ No*
 Bypass channel in use: ☐ Yes ☐ No ☒ NA
3. Area adequately ventilated: ☒ Yes ☐ No*
4. Alarm system for equipment failure or overloads: ☒ Yes ☐ No*
5. Proper flow distribution between units: ☒ Yes ☐ No ☐ NA
6. How often are units checked and cleaned? **Checked twice a shift, cleaned as needed**
7. Cycle of operation: **Continuous**
8. Volume of screenings removed: **~ 4000 pounds combined rags and grit per week.**
9. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

1. Units are rotated every 3 months**9. There was a small leak in the plant water line that supplies water to wash the screens (photo 1).****UNIT PROCESS: Grit Removal – Pista Grit®**

1. Number of units: **2** In operation: **2**
2. Unit adequately ventilated: ☒ Yes ☐ No*
3. Operation of grit collection equipment: ☐ Manual ☐ Time clock ☒ Continuous duty
4. Proper flow distribution between units: ☒ Yes ☐ No* ☐ NA
5. Daily volume of grit removed: **~ 4000 pounds combined rags and grit per week.**
6. All equipment operable: ☒ Yes ☐ No*
7. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

7. Units receive quarterly maintenance. The shroud over one of the impellers was missing (photo 4).

➤ **The truck bay floor had some staining, possibly from debris leaking from the screening and grit storage hoppers above (photo 3).**

UNIT PROCESS: Sedimentation

☒ Primary ☐ Secondary ☐ Tertiary

1. Number of units: **3** In operation: **1**
2. Proper flow distribution between units: ☐ Yes ☐ No* ☒ NA
3. Signs of short circuiting and/or overloads: ☐ Yes ☒ No
4. Effluent weirs level: ☒ Yes ☐ No*
 Clean: ☒ Yes ☐ No*
5. Scum collection system working properly: ☒ Yes ☐ No* ☐ NA
6. Sludge collection system working properly: ☒ Yes ☐ No*
7. Influent, effluent baffle systems working properly: ☒ Yes ☐ No*
8. Chemical addition: ☒ Yes ☐ No
 Chemicals: **Alum is added to reduce TP loading. On discharge side of clarifiers caustic soda is added if needed for pH adjustment**
9. Effluent characteristics: **yellowish, turbid**
10. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

4. **Primaries are covered and difficult to evaluate. Water was a mustardy yellow color (photo 5). Mr. Rumke said operators had drained and cleaned out one of the plant waste basins which emptied into the primary clarifier, raising flow level and diluting the water.**
5. **Skimmers are on a timer. Scum is sent to the scum concentrator and then to digestors.**
- **Mr. Rumke said they try to keep a two foot blanket in clarifier; sludge volume reported on the DMR is measured in the sludge hopper.**

UNIT PROCESS: Screening/Comminution – Fine Screens

- | | | | | |
|---|--|--|---|--|
| 1. Number of Units: | Manual: | 0 | Mechanical: | 3 |
| Number in operation: | Manual: | 0 | Mechanical: | 1 |
| 2. Bypass channel provided: | | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No* | |
| Bypass channel in use: | | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> NA |
| 3. Area adequately ventilated: | | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | |
| 4. Alarm system for equipment failure or overloads: | | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | |
| 5. Proper flow distribution between units: | | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> NA |
| 6. How often are units checked and cleaned? | | Twice a shift | | |
| 7. Cycle of operation: | | Continuous | | |
| 8. Volume of screenings removed: | | Less than a 25 gallon trash bag per day | | |
| 9. General condition: | <input checked="" type="checkbox"/> Good | <input type="checkbox"/> Fair | <input type="checkbox"/> Poor | |

Comments:

UNIT PROCESS: Activated Sludge Aeration

1. Number of units: **3** In operation: **1**
2. Mode of operation: **BNR- 5 stage Bardenpho Biological Reactor Basins followed by membrane filtration**
3. Proper flow distribution between units: ☐ Yes ☐ No* ☒ NA
4. Foam control operational: ☒ Yes ☐ No* ☐ NA
5. Scum control operational: ☒ Yes ☐ No* ☐ NA
6. Evidence of following problems:
- | | | |
|-----------------------------------|-------------------------------|--|
| a. dead spots | <input type="checkbox"/> Yes* | <input checked="" type="checkbox"/> No |
| b. excessive foam | <input type="checkbox"/> Yes* | <input checked="" type="checkbox"/> No |
| c. poor aeration | <input type="checkbox"/> Yes* | <input checked="" type="checkbox"/> No |
| d. excessive aeration | <input type="checkbox"/> Yes* | <input checked="" type="checkbox"/> No |
| e. excessive scum | <input type="checkbox"/> Yes* | <input checked="" type="checkbox"/> No |
| f. aeration equipment malfunction | <input type="checkbox"/> Yes* | <input checked="" type="checkbox"/> No |
| g. other (identify in comments) | <input type="checkbox"/> Yes* | <input checked="" type="checkbox"/> No |
7. Mixed liquor characteristics (as available):
- MLSS: **10,000 mg/L**
 Color: **Chocolate brown**
 Odor: **None**
8. Return/waste sludge:
- A. Return Rate: **4 to 5 Q**
 B. Waste Rate: **70,000 gpd**
 C. Frequency of Wasting: **Daily**
9. Aeration system control: ☐ Time Clock ☐ Manual ☒ Continuous ☐ Other (explain)
10. Effluent control devices working properly (oxidation ditches): ☐ Yes ☐ No* ☒ NA
11. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

6. **BNR Tanks are covered so were not fully observed (photos 9 – 10).
 Foam is controlled in the BNR basins by spraying with a hypochlorite mist (photo 11). Foam was much thicker in the membrane tanks where hypo not added, but is contained.**
9. **Controlled via set points on in-line DO monitors. 2 small blowers and 2 large blowers.**

UNIT PROCESS: Membrane Filtration

- **Four cassettes in water. The vacuum system back-pulses automatically to clean the membranes; a maintenance clean is done every two weeks; recovery clean done once a year. Membrane Turbidimeters are calibrated bi-monthly.**
- **There was some algae noted in the permeate pump line (photo 12).**
- **One of the back pulse tanks had a broken fill valve, resulting in water spilling onto the floor (photo 13). Operators discovered this the day before this inspection and parts for repair had been ordered.**

UNIT PROCESS: Sludge Pumping

1. Number of Pumps: **4** In operation: **2**
2. Type of sludge pumped: ☐ Primary ☒ Secondary ☐ Return Activated
☐ Combination ☐ Other:
3. Type of pump: ☐ Plunger ☐ Diaphragm ☐ Screwlift ☐ Centrifugal
☐ Progressing Cavity ☐ Other:
4. Mode of operation: ☐ Manual ☒ Automatic ☐ Other (explain):
5. Sludge volume pumped: **Pumps are 6.25 MGD capacity each.**
6. Alarm system for equipment failures or overloads operational: ☒ Yes ☐ No ☐ NA
7. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

UNIT PROCESS: Activated Carbon Adsorption

1. Number of units: **6 carbon contactors** In operation: **2**
2. Type of carbon system: ☐ Gravity ☐ Pressure ☐ Up-Flow ☒ Down-Flow
☐ Parallel ☐ Series ☐ Other:
3. Type carbon in use: **Granular**
4. Proper flow distribution between units: ☒ Yes ☐ No* ☐ NA
5. Type of system: ☒ With pumps ☐ Without pumps
If with pumps, are they working? ☐ Yes ☐ No*
6. Flow measurement operational: ☒ Yes ☐ No* ☐ NA
7. pH adjustment facilities: ☐ Yes ☒ No
If yes, type and dose: **NA**
8. Carbon building adequately ventilated: ☒ Yes ☐ No*
9. COD removal: **February 2015: .02 lbs COD/ft³ carbon**
Membrane permeate COD = 16.04 mg/L
Final effluent COD = 5.32 mg/L
10. Frequency of carbon replacement/regeneration: **staggered; every couple of years**
11. General condition: Good ☒ ☐ Fair ☐ Poor

Comments:

1. **Multiple modes - typically operated in down-flow mode.**

UNIT PROCESS: Ultraviolet (UV) Disinfection

1. Number of UV lamps/assemblies: **3 units with 3 bulbs each** In operation: **1**
2. Type of UV system and design dosage: **Calgon**
3. Proper flow distribution between units: ☐ Yes ☐ No* ☒ NA
4. Method of UV intensity monitoring: **Intensity monitors**
5. Adequate ventilation of ballast control boxes: ☒ Yes ☐ No* ☐ NA
6. Indication of on/off status of all lamps provided: ☒ Yes ☐ No*
7. Lamp assemblies easily removed for maintenance: ☒ Yes ☐ No*
8. Records of lamp operating hours and replacement dates provided: ☒ Yes ☐ No*
9. Routine cleaning system provided: ☒ Yes ☐ No*
 Operate properly: ☒ Yes ☐ No*
 Frequency of routine cleaning: **automatic cleaning of bulbs once every 45 minutes.**
10. Lamp energy control system operate properly: ☒ Yes ☐ No*
11. Date of last system overhaul: **Annual cleaning based on run time**
- a. UV unit completely drained ☒ Yes ☐ No*
- b. all surfaces cleaned ☒ Yes ☐ No*
- c. UV transmissibility checked ☒ Yes ☐ No*
- d. output of selected lamps checked ☒ Yes ☐ No*
- e. output of tested lamps
- f. total operating hours, oldest lamp/assembly
- g. number of spare lamps and ballasts available: lamps: ballasts:
12. UV protective eyeglasses provided: ☒ Yes ☐ No*
13. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

- 4. One transmitter in unit one was out - flow was being switched to a different effluent pipe so the transmitter could be serviced and replaced.**
- 11. System is monitored by SCADA; shows when bulbs and ballasts need to be changed.**
- 12. System is off when any maintenance is conducted. Bulbs are enclosed in the effluent lines and cannot be seen when in operation.**

Reuse

- **The Reuse System was not yet in operation at the time of this inspection. A new Reuse building (photo 18) and two storage tanks (photo 17) have been built. The distribution tank was expected to be in use the week of February 6th, but there have been several delays. Most recently, a valve problem was discovered and it had to be rebuilt in Germany. Mr. Rumpke expected to have the new valve by March 16th.**
- **A new reclaim/re-use water line has been installed in the UV building to direct flow to the reclaim water pumps at the rear of this building and to the new reuse building/storage tanks (photos 15 – 16). Once the distribution tank is in use, reuse water will not pass through the carbon contactors or UV disinfection.**
- **In-line turbidimeters and Chlorine monitors have been installed to continuously monitor reuse water (photo 19).**

UNIT PROCESS: Flow Measurement[] Influent [] Intermediate [**X**] Effluent

1. Type measuring device: **Foxboro IMT-Scatbrain-8 FE-Fit**
2. Present reading: **Not noted**
3. Bypass channel: [] Yes [**X**] No
 Metered: [] Yes [] No [**X**] NA
4. Return flows discharged upstream from meter: [] Yes [**X**] No
 Identify:
5. Device operating properly: [**X**] Yes [] No*
6. Date of last calibration: **01/21/15**
7. Evidence of following problems:
 a. obstructions [] Yes* [**X**] No
 b. grease [] Yes* [**X**] No
8. General condition: [**X**] Good [] Fair [] Poor

Comments:

7. Meters are enclosed in effluent pipes- readings sent to SCADA. Could not visually inspect.

UNIT PROCESS: Post Aeration

1. Number of units: **2** In operation: **1**
2. Proper flow distribution between units: ☐ Yes ☐ No* ☒ NA
3. Evidence of following problems: **None noted**
- a. dead spots ☐ Yes* ☒ No
- b. excessive foam ☐ Yes* ☒ No
- c. poor aeration ☐ Yes* ☒ No
- d. mechanical equipment failure ☐ Yes* ☐ No ☒ NA
4. How is the aerator controlled? ☐ Time clock ☐ Manual ☐ Continuous ☐ Other: ☒ NA
5. What is the current operating schedule? **Continuous**
6. Step weirs level: ☐ Yes ☐ No ☒ NA
7. Effluent D.O. level: **pH and DO measured @3:16pm in situ by J. Heath
DO = 8.74 mg/L @ 15.3 deg C
pH = 6.89 s.u. @15.3 deg C**
8. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

4. Cascade aeration

UNIT PROCESS: Effluent/Plant Outfall

1. Type Outfall: ☒ Shore based ☐ Submerged
2. Type if shore based: ☐ Wingwall ☐ Headwall ☐ Rip Rap
3. Flapper valve: ☐ Yes ☐ No ☐ NA
4. Erosion of bank: ☐ Yes ☐ No ☐ NA
5. Effluent plume visible? ☐ Yes* ☐ No
6. Condition of outfall and supporting structures: ☐ Good ☐ Fair ☐ Poor*
7. Final effluent, evidence of following problems:
 - a. oil sheen ☐ Yes* ☐ No
 - b. grease ☐ Yes* ☐ No
 - c. sludge bar ☐ Yes* ☐ No
 - d. turbid effluent ☐ Yes* ☐ No
 - e. visible foam ☐ Yes* ☐ No
 - f. unusual color ☐ Yes* ☐ No

Comments:

- **Effluent discharge point into Broad Run Outfall not observed this inspection. Final effluent samples are collected after UV disinfection at the UV building.**

UNIT PROCESS: Sewage Pumping1. Name of station: **Waste Pump Station**

2. Location (if not at STP):

3. Following equipment operable:

- | | | |
|----------------------|---|------------------------------|
| a. all pumps | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* |
| b. ventilation | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* |
| c. control system | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* |
| d. sump pump | <input type="checkbox"/> Yes | <input type="checkbox"/> No* |
| e. seal water system | <input type="checkbox"/> Yes | <input type="checkbox"/> No* |

4. Reliability considerations:

- | | | | |
|------------------------------------|---|------------------------------|------------------------------|
| a. Class | <input checked="" type="checkbox"/> I | <input type="checkbox"/> II | <input type="checkbox"/> III |
| b. Alarm system operable: | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | |
| c. Alarm conditions monitored: | | | |
| 1. high water level | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | |
| 2. high liquid level in dry well | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> NA |
| 3. main electric power | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> NA |
| 4. auxiliary electric power | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> NA |
| 5. failure of pump motors to start | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> NA |
| 6. test function | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | |
| 7. other | <input type="checkbox"/> Yes | <input type="checkbox"/> No | |

d. Backup for alarm system operational: ☒ Yes ☐ No ☐ NAe. Alarm signal reported to (identify): **Control room via SCADA**

f. Continuous operability provisions:

- | | | |
|---|---|--------------------------------|
| <input checked="" type="checkbox"/> generator | <input type="checkbox"/> two sources of power | |
| <input type="checkbox"/> portable pump | <input type="checkbox"/> 1 day storage | <input type="checkbox"/> other |

5. Does station have bypass: ☐ Yes* ☒ No

- | | | |
|------------------------------|-------------------------------|-----------------------------|
| a. evidence of bypass use | <input type="checkbox"/> Yes* | <input type="checkbox"/> No |
| b. can bypass be disinfected | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| c. can bypass be measured | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

6. How often is station checked? **Each shift**7. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

➤ **Did not enter pump station.**

UNIT PROCESS: Centrifugation - WAS

1. Number of units: **1** In operation: **1**
2. Purpose of centrifuges: ☒ Thickening ☐ Dewatering ☐ Other
3. Operation of equipment: ☐ Manual ☒ Automatic ☐ Other
4. Centrifuge run time: **Continuous**
5. Volume of influent sludge flow: **Not requested**
6. Amount cake produced: **NA**
7. Sludge solids: Influent: **NA**
Effluent: **NA**
8. Conditioning chemical fed: **None** Dose: **NA**
9. Centrate return location: **Waste Pump Station**
- Signs of problems: ☐ Yes* ☒ No
10. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:**6. Thickened sludge is returned to the digesters**

UNIT PROCESS: Anaerobic Digestion

1. Number of units: **2** In operation: **1**
2. Type of sludge digested: **WAS and Primary Sludge**
3. Type of digester: ☐ Primary ☐ High rate ☐ Secondary ☒ Standard rate
4. Frequency of sludge application to digestors: **Daily**
5. Number of recirculation pumps: **1 each** In operation: **1**
6. Sludge retention time: **~28 days**
7. Provisions for pH adjustment:
Utilized: ☐ Yes ☒ No ☐ Yes ☐ No ☒ NA
8. Location of supernatant return in the plant: ☐ Head ☐ Primary ☒ Other (specify): **None-Complete mix**
- Supernatant return rate: **NA**
9. Gas production rate: **Not requested**
10. Process control testing:
a. reduction of volatile solids: ☐ Yes ☐ No
b. volatile acids: ☐ Yes ☐ No
c. pH: ☐ Yes ☐ No
d. temperature: ☐ Yes ☐ No
e. alkalinity: ☐ Yes ☐ No
11. Signs of overloading: ☐ Yes* ☒ No
12. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

9. Methane gas produced is collected and burned in the boiler or flared off depending on need. Flare is included in the facility's air permit.

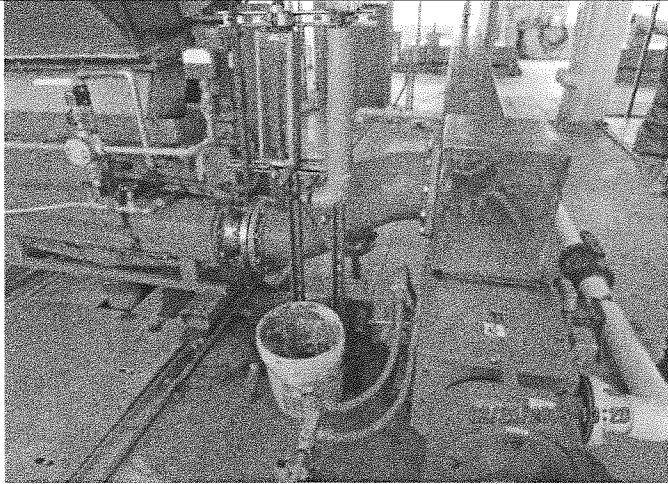
➤ **One valve in the lower level of the digester building was making a whistling noise - Mr. Rumke called one of the operators to investigate.**

UNIT PROCESS: Centrifugation - dewatering

1. Number of units: **2** In operation: **1**
2. Purpose of centrifuges: ☐ Thickening ☒ Dewatering ☐ Other
3. Operation of equipment: ☐ Manual ☒ Automatic ☐ Other
4. Centrifuge run time: **6-8 hours/day; 7 days per week**
5. Volume of influent sludge flow: **Not requested**
6. Amount cake produced: **~20,000 wet tons/day**
7. Sludge solids: Effluent: **~ 20%**
8. Conditioning chemical fed: **polymer Everfloc 4064**
9. Centrate return location: **Waste Pump Station**
- Signs of problems: ☒ Yes* ☐ No
10. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

- 10. The centrate was milky white, indicating high level of polymer (photo 21). Mr. Rumke said they are adjusting the polymer feed rate to reduce overfeeding while still achieving plant goals. Centrate is sent to the waste pump station and then to the primary clarifiers.**
- **Mr. Rumke told us they are setting up a "Day Tank" to drain residual polymer out of the reinforced storage cubes to reduce waste.**
 - **Biosolids are collected and land applied by Synagro; ~ 5 trucks per week.**



1) Small leak on plant water line supplying water to wash screen for unit 1.



2) Truck loading bay for rags/grit.



3) Stains from leaks from hoppers above.



4) Pista grit with exposed impeller.



5) Primary clarifier showing high flow.

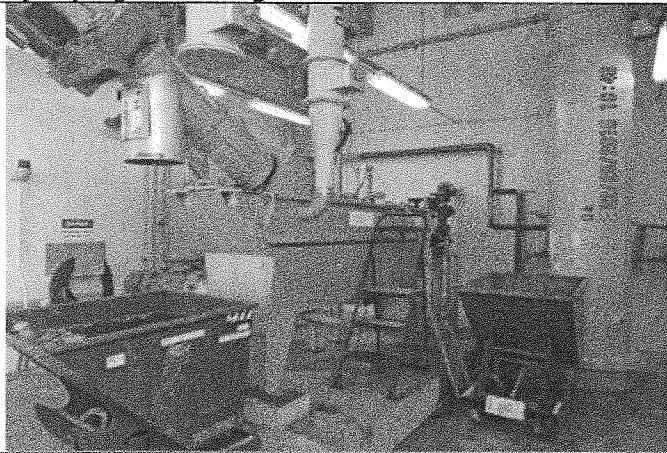
Facility name: Broad Run WRF
 VPDES Permit No. VA0092383
 Site Inspection Date: February 26, 2015
 Photos By: A. Dooley Layout by: S. Allen



6) Septage receiving station.



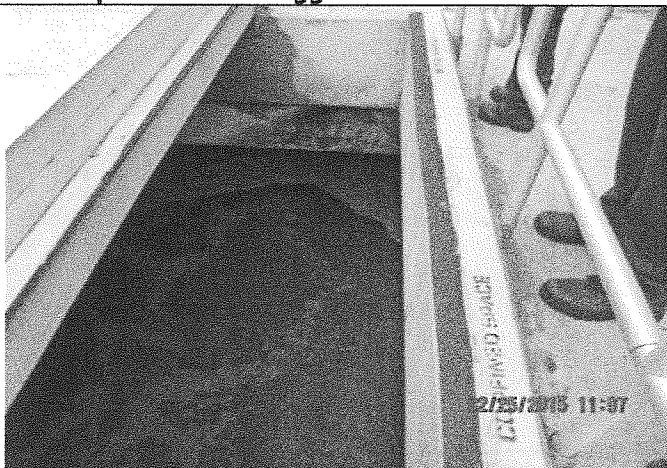
7) Septage receiving station.



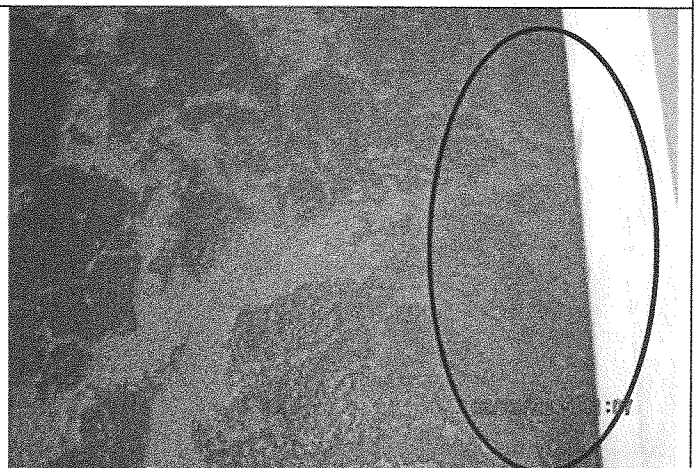
8) Rags separator w/ water going into rags dumpster due to clogged water drain line.



9) BNR tanks



10) Mixed liquor in BNR tanks



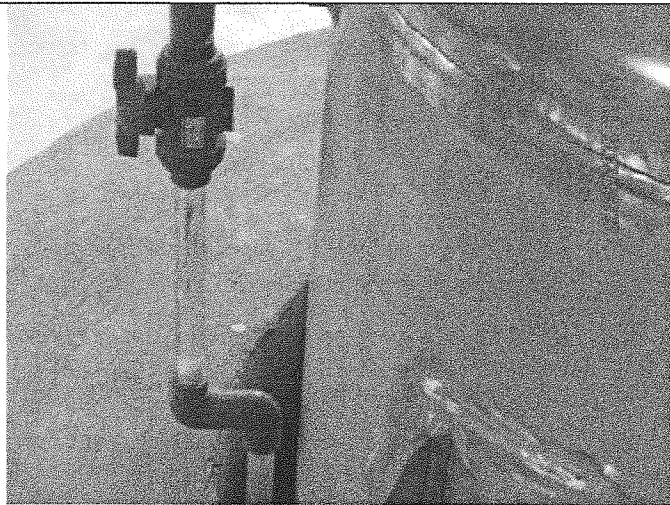
11) Hypochlorite added as mist to BNR tank for foam control

Facility name: Broad Run WRF
Site Inspection Date: February 26, 2015

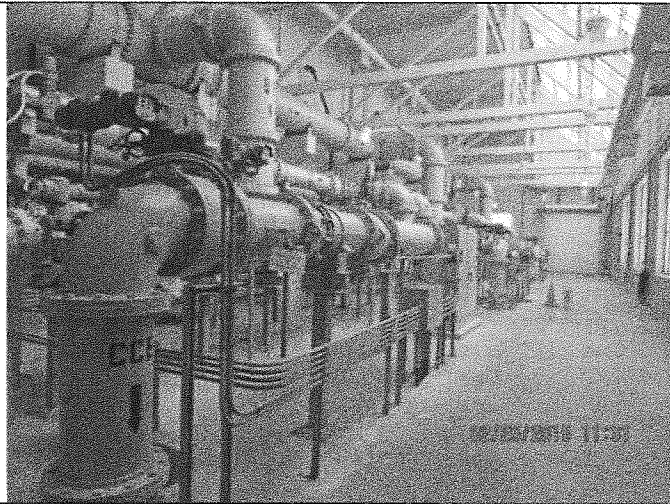
Photos By: A. Dooley

VPDES Permit No. VA0092383
Layout by: S. Allen

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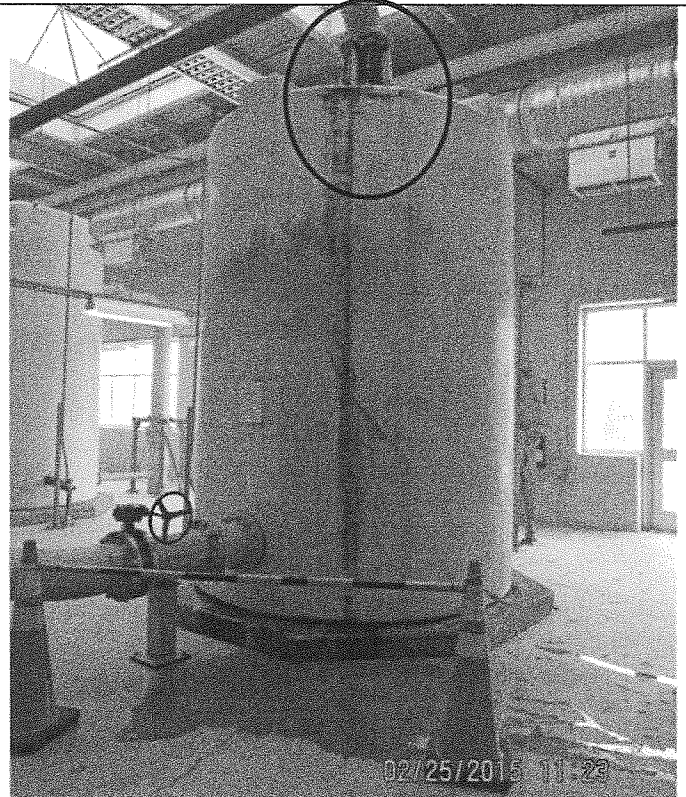
12) Algae growth in permeate pump line.



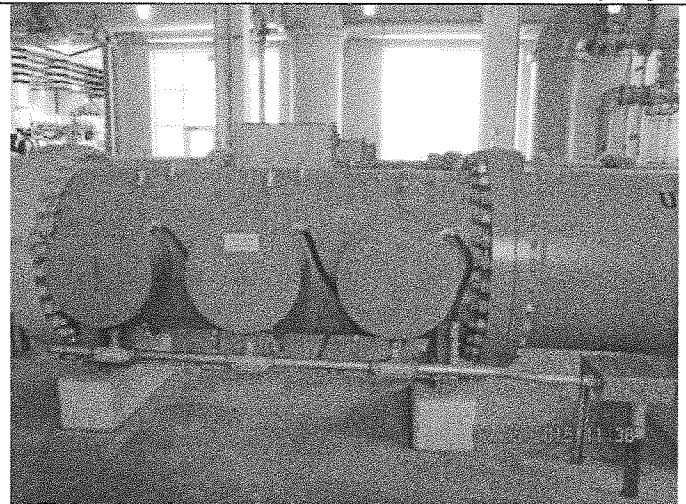
14) Carbon Contactors.



15) New line to reuse distribution tank.



13) Permeate tank with broken fill (discovered day before this inspection and scheduled for repair).

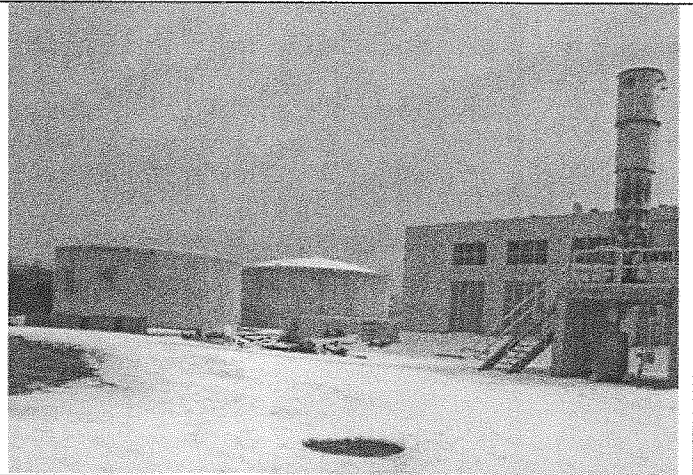


16) UV in final effluent line.

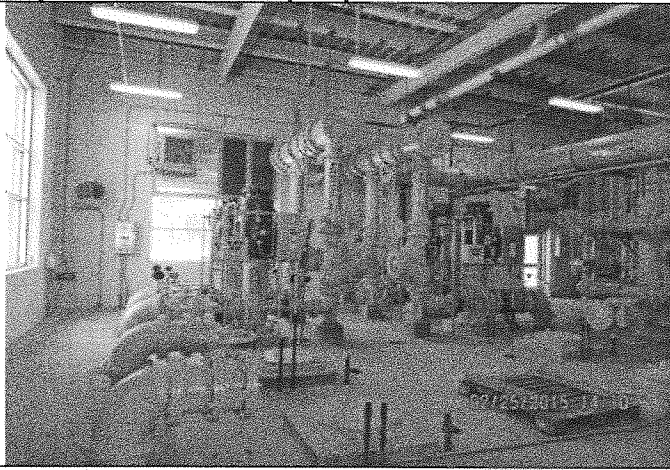
Facility name: Broad Run WRF
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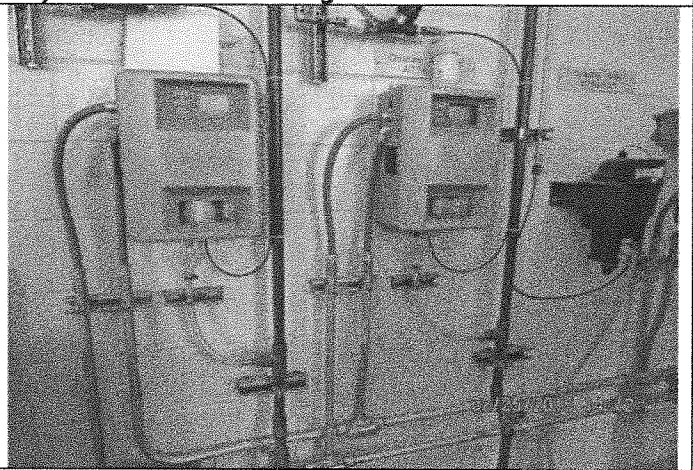
16) New line to reuse pumps



17) New reclaimed storage tanks.



18) New reuse building



19) In-line monitors for TRC and Turbidity on reuse water.



20) Thickening and dewatering centrifuges



21) Centrate showing high polymer concentration.

Facility name: Broad Run WRF
Site Inspection Date: February 26, 2015

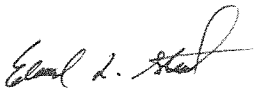
Photos By: A. Dooley

VPDES Permit No. VA0092383
Layout by: S. Allen

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**DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
LABORATORY INSPECTION REPORT**

11/2014

PERMIT #: VA0091383	INSPECTION DATE: February 26, 2015	PREVIOUS INSP. DATE: July 18, 2012	PREVIOUS EVALUATION: July 18, 2012	TIME SPENT: 4 hrs
NAME/ADDRESS OF FACILITY: Broad Run WRF 44961 Loudoun Water Way Ashburn, VA 20146		FACILITY CLASS: (X) MAJOR () MINOR () MINOR (Small) () VPA	FACILITY TYPE: (X) MUNICIPAL () INDUSTRIAL () FEDERAL	UNANNOUNCED INSPECTION? (X) YES () NO
				FFY-SCHEDULED INSPECTION? (X) YES () NO
INSPECTOR(S): S. Allen		REVIEWER(S): 	PRESENT AT INSPECTION: Lisa Janovsky, Martin Robinson, Amy Dooley – DEQ Joshua Heath- Loudoun Water Broad Run WRF	

LABORATORY EVALUATION		DEFICIENCIES?		
		Yes	No	
LABORATORY RECORDS		X		
GENERAL SAMPLING AND ANALYSIS			X	
pH PROCEDURE			X	
DISSOLVED OXYGEN PROCEDURES		X		
VELAP CERTIFICATION (on site Environmental Laboratory)		Yes	No	
Does the laboratory have VELAP certification (interim or final)? Loudoun Water Laboratory certificate #2904		X		
– Document the laboratory's VELAP laboratory number:		450115		
– Document the effective date of the VELAP certification: Certificate 2904		6/15/2014		
– Document the expiration date of the VELAP certification:		6/16/2016		
– List the certified parameters:		E. coli, Turbidity, COD, TSS, BOD, CBOD, TP, TKN, NO ₂ +NO ₃ ,		
VELAP ACCREDITATION (Commercial Environmental Laboratory)		Yes	No	
IS A VELAP ACCREDITED LAB USED FOR OTHER PERMIT REQUIRED ANALYSES? VELAP#, LAB NAME, ADDRESS and LIST PARAMETERS:		X		
VELAP #	LAB NAME			PARAMETERS
460222	Pace Asheville, NC			Metals, hardness, TDS
460221	Huntersville NC VELAP Certification	BIS(2-ETHYLHEXYL) PHTHALATE (DI(2-ETHYLHEX(DEHP)YL)PHTHALATE)	X	
IF PERMIT REQUIRED SAMPLE ANALYSIS IS PERFORMED AT ANOTHER LOCATION, ARE SHIPPING PROCEDURES ADEQUATE? Certificate of Analysis do not indicate if samples were shipped to other locations once received at Pace in Ashville.			X	

COPIES: (X) DEQ - RO; (X) Owner, () Other:

LABORATORY RECORDS SECTION

LABORATORY RECORDS INCLUDE THE FOLLOWING:

<input checked="" type="checkbox"/>	SAMPLING DATE	<input checked="" type="checkbox"/>	ANALYSIS DATE	<input type="checkbox"/>	CONT MONITORING CHART
<input checked="" type="checkbox"/>	SAMPLING TIME	<input checked="" type="checkbox"/>	ANALYSIS TIME	<input checked="" type="checkbox"/>	INSTRUMENT CALIBRATION
<input checked="" type="checkbox"/>	SAMPLE LOCATION	<input checked="" type="checkbox"/>	TEST METHOD	<input type="checkbox"/>	INSTRUMENT MAINTENANCE
				<input checked="" type="checkbox"/>	CERTIFICATE OF ANALYSIS

WRITTEN INSTRUCTIONS INCLUDE THE FOLLOWING:

<input checked="" type="checkbox"/>	SAMPLING SCHEDULES	<input type="checkbox"/>	CALCULATIONS	<input checked="" type="checkbox"/>	ANALYSIS PROCEDURES
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	YES	NO	N/A
DO ALL ANALYSTS INITIAL THEIR WORK? Facility operators do initial daily effluent field analyses; Analyses done by the contract laboratory do not have the analyst's initials.		X	
DO BENCH SHEETS (or LOG BOOK) INCLUDE ALL INFORMATION NECESSARY TO DETERMINE RESULTS?	X		
IS THE DMR COMPLETE AND CORRECT? LIST MONTH(S) REVIEWED: October – December 2014 and 2014 quarterly DMRs	X		
ARE ALL MONITORING VALUES REQUIRED BY THE PERMIT REPORTED?	X		
DOES CHAIN OF CUSTODY DOCUMENT PROPER SAMPLE PRESERVATION WAS MET? Samples for Dissolved metals (Copper and Zinc) are not filtered immediately upon sample collection. On 3 out of 4 Chain of Custody forms for 2014 reviewed, metals samples were not acid preserved.		X	
WHEN THE CERTIFICATE OF ANALYSIS CONTAINS FLAGGED DATA IS THE 'FLAG' REPORTED ON THE DMR? No flags were noted on the Certificates of Analysis			X

GENERAL SAMPLING AND ANALYSIS SECTION

	YES	NO	N/A
ARE SAMPLE LOCATIONS ACCORDING TO PERMIT REQUIREMENTS?	X		
ARE PERMIT REQUIRED SAMPLE COLLECTION PROCEDURES APPROPRIATE?	X		
ARE EFFLUENT SAMPLES REPRESENTATIVE OF THE MONITORED ACTIVITY?	X		
ARE PERMIT REQUIRED COMPOSITE SAMPLES FLOW PROPORTIONAL? NOTE: Equal volume composite aliquots are acceptable <u>if the instantaneous flow is within $\pm 10\%$ of the daily average flow during the monitoring period</u> Some permits specify how the composite is to be taken (e.g., 5G/8HC).	X		
IS COLLECTION SAMPLE EQUIPMENT ADEQUATE?	X		
IS FLOW MEASUREMENT ACCORDING TO PERMIT REQUIREMENTS?	X		

**DEPARTMENT OF ENVIRONMENTAL QUALITY – WATER DIVISION
LABORATORY INSPECTION REPORT SUMMARY**

FACILITY NAME:	Broad Run WRF	Permit #:	VA0091383	INSPECTION DATE:	February 26, 2015
LABORATORY EVALUATION			No required actions at this time		
		X	REQUIRED CORRECTIVE ACTION(s) IDENTIFIED		
SUMMARY of REQUEST FOR CORRECTIVE ACTION					
Lab Records					
<p>Laboratory Records section deficiency and required action:</p> <p>Review of the Chain of Custody Forms and Certificates of Analysis showed the following issues. These issues must be reconciled with the contracted laboratory:</p> <p style="text-align: center;">Certificates of Analysis (CoA)</p> <p>Certificates of Analysis (CoA) must indicate where analyses were performed and include the initials for the analyst. For the CoAs of quarterly analyses in 2014 reviewed for this inspection, the cover letter states: "Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted."</p> <p>For the sample collected January 7, 2014, the COA page lists three laboratories and it is unclear which sample was analyzed by which laboratory.</p> <p>For samples collected in July 2014, April 2014, and Oct 2014, the only lab listed on the CoA page is the Asheville, NC location. Pace has several labs certified for bis(2-Ethylhexyl)phthalate but Asheville is not currently one of them.</p> <p style="text-align: center;">Method Citation</p> <p>Analytical methods on the contract laboratory's Certificate of Analysis are not referenced properly. The year the method was last approved must be included in the method number (e.g. - Metals methods should be 200.7 rev 4.4 (1994), not just 200.7)</p> <p style="text-align: center;">Dissolved Metals</p> <p>40 CFR Part 136, Table II—Required Containers, Preservation Techniques, and Holding Times, Table IB - Metals, states: "Preservation- HNO₃ to pH <2, or at least 24 hours prior to analysis¹⁹", and Footnote 7 states: "For dissolved metals, filter grab samples within 15 minutes of collection and before adding preservatives."</p> <p>Review of the Chain of Custody and Certificate of Analysis indicates that dissolved metals samples are not filtered upon collection. Pace Analytical's "Sample Condition Upon Receipt" form has NA checked for "filtered volume received for Dissolved Tests" line.</p>					

SUMMARY of REQUEST FOR CORRECTIVE ACTION (cont)
General Sampling and Analysis
General Sampling and Analysis section deficiency and required action: 1. None Noted
pH Analysis
pH deficiency and required action: 1. A Lab Control Sample (LCS) must be run annually.
D.O. Analysis
D.O. deficiency and required action: 1. Operators who analyze DO for compliance purposes must perform and document Demonstration of Capability.
OTHER – Comments or Observations

ANALYST:	Josh Heath	VPDES NO.	VA0091383
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Parameter: Dissolved Oxygen
Method: Luminescence-based Sensor Procedure
11/2014

METHOD OF ANALYSIS:

<input type="checkbox"/>	ASTM D 888-09 (C)
<input checked="" type="checkbox"/>	HACH LDO – 10360
<input type="checkbox"/>	In-Situ - 1002-8-2009
<input type="checkbox"/>	YSI – ASTM D 888-09 (C)

	Y	N
1) Has Initial Demonstration of Laboratory Capability been performed by each analyst? [ASTM 29.5 and ASTM 31.3]		X
a. Prepare air-saturated water by bubbling air for at least 30 min. through 1500mL water that is at room temperature ($\pm 2^{\circ}\text{C}$). NOTE: An in-line air filter must be used with the aeration tubing (i.e., cotton, glass wool, other suitable material).		
b. Allow air-saturated water to equilibrate for 45 – 60 minutes.		
c. Transfer aerated water to four clean BOD bottles, beakers or other suitable containers until overflowing, then sealed.		
d. Analyze samples.		
e. Use a D.O. table to calculate theoretical D.O. based on sample temperature and barometric pressure (or altitude correction factor applied). Results must be between 97-104% of calculated value.		
2 Are calibration results (mg/L) within $\pm 4\%$ of the barometric (or altitude) corrected oxygen saturated water value? [SM 21 B.2 or SM 22 1020 B.2.]	Unknown	
3) If samples are collected, is collection carried out with a minimum of turbulence and air bubble formation? [ASTM 6.2]	In Situ	
4) If samples are collected, is the sample bottle allowed to overflow several times its volume? [ASTM 6.4]	In Situ	
5) Is meter calibrated before use or at least daily? NOTE: If using water saturated air the instrument must be in 'O ₂ Calibration' mode and sensor cap must be above surface of liquid. [ASTM 29.2, 29.4 & 29.5]	X	
6) Is calibration verification within 97% to 104% of the theoretical D.O.? [ASTM 29.7.1] Temperature must be recorded. [ASTM 29.5.6]	Unknown	
7) Is calibration procedure performed according to manufacturer's instructions? [Mfr.]	X	
8) Does the lot code on the meter display match the lot code printed on the sensor cap? NOTE: Code begins with a number between '3' and '9'. NOTE: This requirement may not be applicable for sensors from other manufacturers. [Mfr.]	X	

- 9) Is sensor cap replaced after one year? **NOTE:** "Cap Expired icon" will display in results window and data exported will be flagged with an asterisk. This requirement may not be applicable for sensors from other manufacturers. [Mfr.]
- 10) Are air bubbles trapped on probe tip dislodged before taking a reading? [Mfr.]
- 11) Is black surface of the sensor cap clean and unscratched? This requirement may not be applicable for sensors from other manufacturers. [Mfr.]
- 12) When taking reading is probe deep enough in sample to cover the thermister on side of probe? **NOTE:** Care should be taken to not touch the thermister because it will cause an incorrect temperature reading. [Mfr.]
- 13) Is there adequate flow/stirring during calibration and sample analysis? [ASTM 29.6 and Mfr.]
- 14) Is meter stabilized before reading D.O.? [Mfr.]
- 15) Is temperature recorded at time of analysis? [Permit, ASTM 29.5.6]
- 16) Is accuracy of thermister checked annually? [Permit]
- 17) Is 'Dry Storage' used for probes immersed less than 6 hrs per day and 'Wet Storage' for tips immersed more than 6 hrs per day? This requirement may not be applicable for sensors from other manufacturers. [Mfr.]

See comments	
X	
X	
X	
In Situ	
X	
X	
X	
X	

PROBLEMS:	1) The IDC for DO had not been done at the time of this inspection; however, the staff had started the process of completing.
COMMENTS	<p>2,6) Not checked against a saturation chart.</p> <p>9) The DO probe went into service Sept 8, 2014. D.O. Probe is a LDO101 with serial number:14120599001 per M. Rumke 5/12/2015</p> <p>➤ The Hach user manual for the Luminescent Dissolved Oxygen Probe (LDO 101 series), under water saturated air calibration, states: "Put a stopper in the bottle and shake the bottle vigorously for approximately 30 seconds to saturate the entrapped air with water. Allow up to 30 minutes for contents to equilibrate to room temperature." While the operator did shake the DO bottle , water was not left to equilibrate to room temperature prior to probe calibration. The probe does have a thermister for temperature adjustment..</p>

ANALYST:	Josh Heath	VPDES NO	VA0091383
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Meter: Hach HQ40d

Parameter: Hydrogen Ion (pH)
Method: Electrometric
11/2014

METHOD OF ANALYSIS:

X	21 st Edition of Standard Methods (SM 21) – 4500-H ⁺ B-2000 (SM 21 pH)
	22 nd Edition of Standard Methods (SM 22), or Online Editions of Standard Methods – 4500-H ⁺ B-2011 (SM 22 pH)

pH is a method-defined analyte so modifications are not allowed. [40 CFR Part 136.6]

	Y	N
1) Is a certificate of operator competence or initial demonstration of capability available for <u>each analyst/operator</u> performing this analysis? NOTE: Analyze 4 samples of known pH; you may use an external source of buffers or other known standards (different lot/manufacturer than buffers used to calibrate meter). Recovery for each of the 4 samples must be +/- 0.2 SU of the known concentration of the sample. [SM 1020 B.1]	X	
2) IF a replicate sample is analyzed is there a written procedure for which result will be reported on DMR (Sample or Replicate) and is this procedure being followed? [DEQ – based on EPA Good Laboratory Practices Standards]	In Situ	
3) Is a Laboratory Control Sample (LCS) tested at least annually and are results within acceptance criteria? [SM 21 B.2 or SM 22 1020 B.3.] NOTE: LCS should be a purchased Proficiency Test (PT) sample or a different buffer other than ones used for calibration of the meter [with a ±0.1 SU acceptance range or within "Acceptable Range" specified by the PT provider].. NOTE: The same pH buffer [values] used for calibration of the instrument can be used as LCS if from a different source or different lot.		X
4) Is the electrode in good condition (no chloride precipitate, scratches, deterioration, etc.)? [SM 21 pH or SM 22 pH 2.b./c. and 5.b.]	X	
5) Is electrode storage solution in accordance with manufacturer's instructions? [SM 21 pH or SM 22 pH 4.a. and Mfr.]	X	
6) Is meter calibrated on at least a daily basis using three buffers all of which are at the same temperature? [SM 21 pH or SM 22 pH 4.a.] NOTE: Start with Buffer 7 unless manufacturer's instructions state otherwise. [NOTE: If meter is not capable of 3 buffer calibration use 2 buffers bracketing the expected sample pH and then <u>measure</u> a 3 rd buffer (the measurement value recorded must be ±0.1 SU), and then <u>reread and record</u> value of buffer 7 to ensure ±0.1 SU.]	X	
7) After calibration, is a buffer analyzed as a check sample to verify that calibration is correct? Verification measurement should be within +/- 0.1 SU. [SM 21 1020 B 10.c. or SM 22 1020 B 11.c.]	X	
8) Is calibration verification measurement repeated with every 10 samples and at the end of a series of samples? Verification measurement should be within +/- 0.1 SU. [SM 21 pH or SM 22 pH 4020 B 2.b.] NOTE: Not applicable if pH meter is calibrated before taking any measurement (e.g., if operator monitors daily pH at more than one facility and calibrates before each measurement).	NA	

- 9) Do the buffer solutions appear to be free of contamination or growths? [SM 21 pH or SM 22 pH 3.a.]
- 10) Are buffer solutions within the listed shelf-life or have they been prepared within the last 4 weeks? [SM 21 pH or SM 22 pH 3.a.]
- 11) Is the cap or sleeve covering the access hole on the reference electrode removed when measuring pH? [Mfr.]
- 12) Is sample analyzed within 15 minutes of collections? [40 CFR Part 136]
- 13) Is the electrode rinsed and then blotted dry between reading solutions (Disregard if a portion of the next sample analyzed is used as the rinsing solution.)? [SM 21 pH or SM 22 pH 4.a and 4.b]
- 14) Is the sample stirred gently at a constant speed during measurement? [SM 21 pH or SM 22 pH 4.b.]
- 15) Does the meter hold a steady reading after reaching equilibrium? [4.b.]

X	
X	
X	
X	
X	
In Situ	
X	

PROBLEMS:	3) LCS must be run annually
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DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
SAMPLE ANALYSIS HOLDING TIME/CONTAINER/PRESERVATION CHECK SHEET

Revised 11/2014 [40 CFR, Part 136.3, Table II]

FACILITY NAME:		Broad Run WRF		VPDES NO	VA0091383	DATE:	Feb 26, 2015	
HOLDING TIMES [Note: Collection period (for composites) and Sample Collection time (end of collection period) must be recorded on the COC.]		SAMPLE CONTAINER			PRESERVATION [Note: Preservation is to occur within 15 minutes of the end of the collection period.]			
PARAMETER	APPROVED	LOGGED?		ADEQ. VOLUME	APPROP. TYPE	APPROVED	MET?	CHECKED?
		Y	N					
pH	15 MIN.	X		In Situ	In Situ	Within 15 minutes		
DISSOLVED O ₂	15 MIN	X		In Situ	In Situ	Within 15 minutes		
TOTAL METALS	6 MONTHS					HNO ₃ pH<2 Dissolved Metals: 0.45 µm filter immediately	X	X
TOTAL HARDNESS	6 MONTHS					HNO ₃ or H ₂ SO ₄ to pH <2	X	X
Di-2-EthylHexyl Phthalate	7 Days to Extract, Analyze w/in 40 Days					≤6° C	X	X
PROBLEMS:	40 CFR Part 136, Table II—Required Containers, Preservation Techniques, and Holding Times, Table IB - Metals, states: "Preservation- HNO ₃ to pH <2, or at least 24 hours prior to analysis ¹⁹ , and Footnote 7 states: "For dissolved metals, filter grab samples within 15 minutes of collection and before adding preservatives." Review of the Chain of Custody and Certificate of Analysis indicates that dissolved metals samples are not filtered upon collection.							

**DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
EQUIPMENT TEMPERATURE LOG/THERMOMETER VERIFICATION CHECK SHEET**

11/2014

FACILITY NAME:	Broad Run WRF		PERMIT NO:	VA0091383		DATE:	February 26, 2015			
EQUIPMENT	Preservation Range	In Range?	Inspector Reading	Checked & Logged Daily?	Correct Increment?	DATE CHECKED	MARKED	OFFSET VALUE¹ (Correction)	ANNUAL THERMOMETER VERIFICATION	
									<i>Is the NIST / NIST-Traceable Reference Thermometer within the manufacturer's expiration date or recertified yearly?</i>	
									Yes/No	
									X	
AUTO SAMPLER	1-6° C	Yes No	-C	Yes No	X	2/4/15	Yes No	-C	°C	
pH METER	± 1° C	X	3.0	X	X	2/19/14	X	0	19.8	
D.O. METER	± 1° C	X	[REDACTED]	[REDACTED]	[REDACTED]	10/27/14	X	0	23.5	

PROBLEMS:

Annual NIST check for the pH probe was slightly overdue on the day of this inspection. Mr. Heath mentioned that they had someone coming out to perform instrument calibrations in the next month.

COMMENTS:

The pH probe was not marked with annual NIST check information, but paperwork with this information was supplied.

¹ Offset Value tolerances (reference NIST 105-6): Sampling Refrigerator and Auto Sampler, pH and D.O. meters must be within ±2°C (2 times tolerance value). Thermometers measuring Outfall permit compliance must be within ±1.0°C (2 times tolerance value).

ATTACHMENT 7

April 8, 2016

MEMORANDUM

TO: Broad Run WRF Permit File (VA0091383)

FROM: Alison Thompson

SUBJECT: Permit Reissuance Site Inspection of New Outfall Locations

The purpose of this memo is to document the conditions at the five new outfalls proposed in the Broad Run WRF permit. These outfalls are for the reclaimed water distribution system. Bruce Ringrose from Loudoun Water was present at this site inspection on October 6, 2015.

The flows from all five proposed outfalls flow via unnamed tributaries to Broad Run.

Outfall 002 is located near the National Rural Utilities Finance Corporation building on Cooperative Way in Loudoun County. The reclaimed water flush tap will flow for 60 minutes at a rate of 1000 gallons per minute (GPM). Since the water is chlorinated, the discharge will flow through a basket of dechlorination tablets before flowing down a rip rap channel to a stormwater retention pond. This is a wet pond that also receives flow from the adjacent roadways. Water from this pond flows through a culvert to another wet pond on the other side of the Harry Byrd Highway.

Outfall 003 is located on Beaumeade Circle in the industrial park. The flush tap is towards the back of the parking lot of Raging Wire. A hose will be connected to the flush tap with a basket of dechlorination tablets at the end of the hose. The discharge (approximately 500 GPM) will flow down the curb to a dry pond. The flow will continue through a concrete stormwater pipe through another dry pond and under Loudoun County Parkway.

Outfall 004 is also located on Beaumeade Circle in the industrial park. The flush tap is in the front parking lot of the AT&T service line. Loudoun Water will use a diffuser that will discharge the dechlorinated water to a drop inlet and then into the second dry pond that also receives flow from Outfall 003. This discharge (approximately 500 GPM) will also flow under Loudoun County Parkway.

Outfall 005 is located on Filigree Court in the industrial park. The flush tap is located in the parking lot of Equinex. A hose will be connected to the flush tap with a basket of dechlorination tablets at the end of the hose. The discharge (approximately 1800 GPM) will flow to a drop inlet to the stormwater collection system. All of this part of the stormwater collection system is concrete pipe. The flows eventually daylight on the other side of the Loudoun County Parkway at one of the stormwater ponds located on the golf course.

Outfall 006 is located on Hastings Drive in the industrial park. The flush tap is towards the back of the parking lot of Grizzley & Quill. A hose will be connected to the flush tap with a basket of dechlorination tablets at the end of the hose. The discharge (approximately 1400 GPM) will flow down the curb to a drop inlet. The stormwater pipe connects to the pipe that also conveys the flows from Outfall 005.



ASHBURN RD

RIVERSIDE PKWY

Loudoun

Montgomery

ASHBURN VILLAGE BVD

LOUDOUN COUNTY PKWY

RUSSELL BRANCH

7

BROAD RUN

ALGONKIAN PKWY

28

GLOUCESTER PKWY

BEAVERDAM RUN

RWTP

28

ATLANTIC BVD

28

CABIN BRANCH NUMBER 1

WAXPOOL RD

WAXPOOL RD

28

CASCADES PKWY

LOUDOUN COUNTY PKWY

WAXPOOL RD

W CHURCH RD

267

N

National
Rural
Utilities
Finance
Corp.

Business
Silt
Loan
Rural
Silt
Loan



